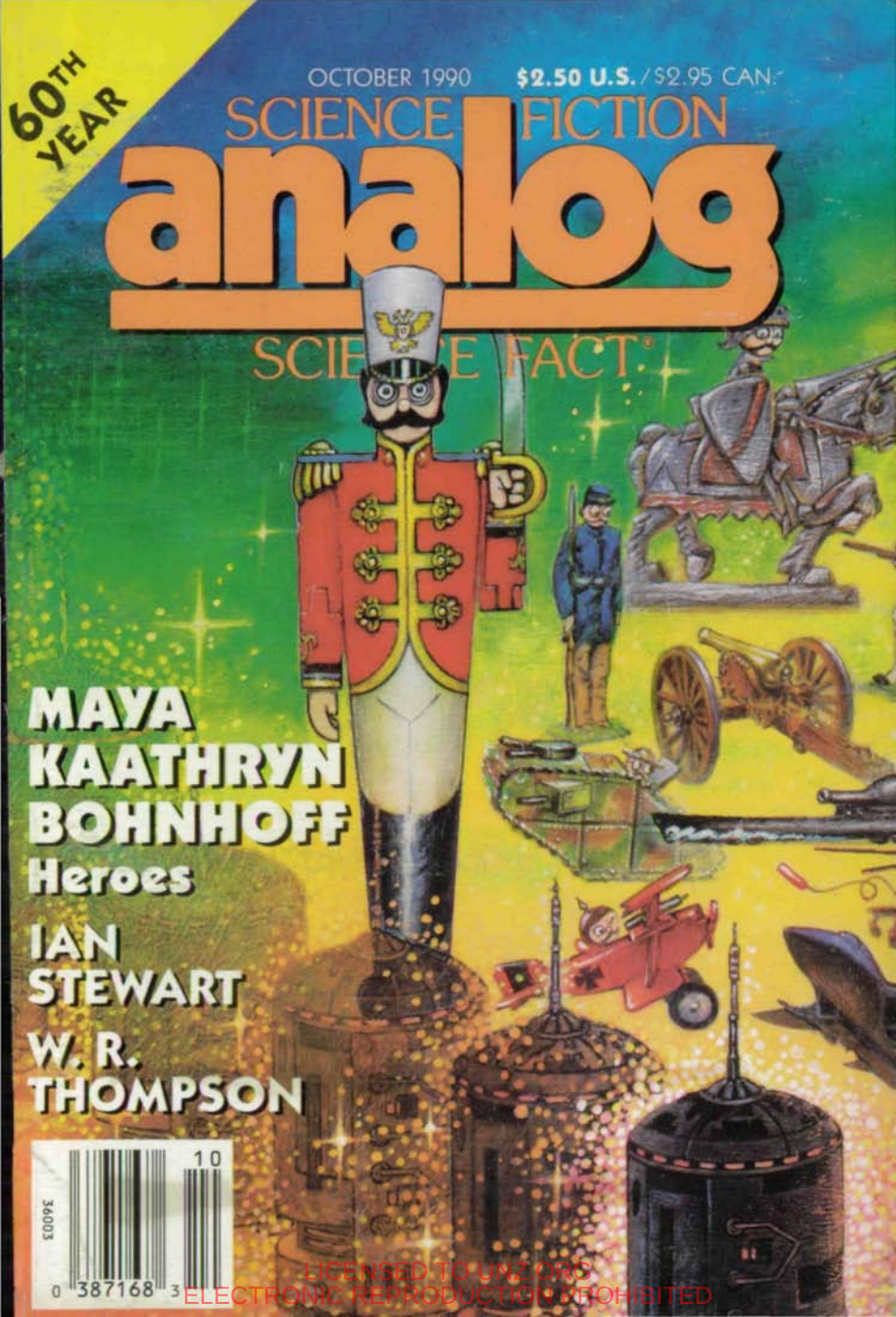

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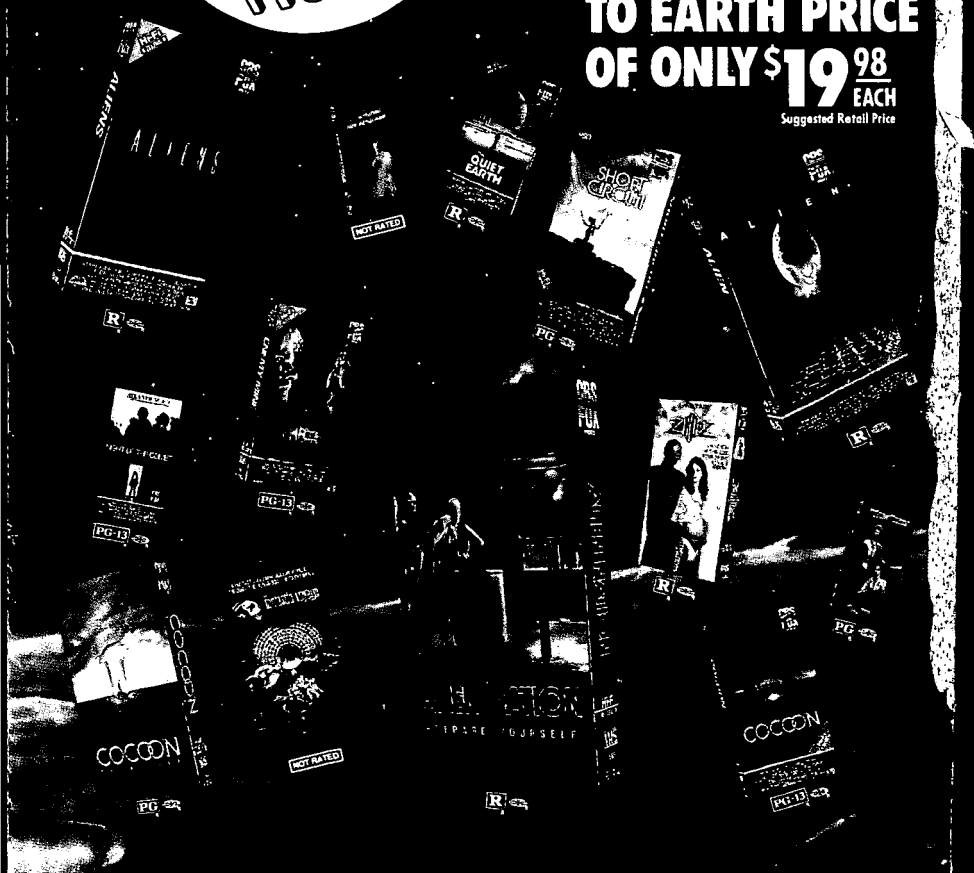

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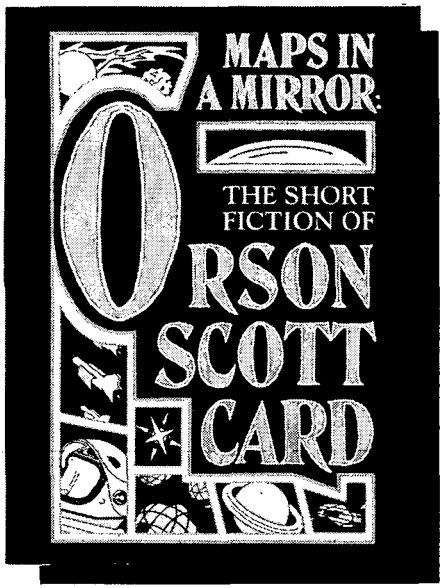

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Editorial

AUTHORITY VS. CONSENSUS

Stanley Schmidt

A bit more than a year ago (in June 1989) I had an essay in this space called "Tools of the Trade," about the currently fashionable controversy over what pronoun should be used to refer to a person whose gender is unknown, unspecified, or irrelevant. Many readers (of both genders) wrote letters telling me how very right or very wrong I was. There were plenty of both and not many in between. We printed some of those letters in "Brass Tacks," and they drew still others. I must confess to a certain amount of sympathy with the relatively few who asked, "Why are all these people making such a fuss over so little?" and I don't plan to say much more about the original question than I have already said. But some of those letters have suggested, though in some cases perhaps without realizing it, a *new* question, and that is my subject today.

What *is* "the English language"—and who decides?

Several of the readers who wrote in response to either my original remarks or the first wave of letters commenting on them maintained that English already has a generally accepted third-person singular, gender-neutral pronoun that can be used in cases where some reformers advocate "s/he." Several candidates were put forward, including "it" and "they."

I had already remarked, in a reply to a Brass Tacks letter, that "it" didn't qualify because "it specifically implies *lack* of gender, but the problem concerns beings which *have* gender which is not specified." At least a couple of follow-up letters assured me my argument was "dead wrong," and proceeded to enlighten me with counter-examples involving things like insects and farm animals. Clearly those do have gender, and few people have much compunction about calling them "it." This merely proves that my Brass Tacks reply was composed a bit too hastily to cover everything. Most people who aren't biologists don't think of beetles or sheep as having gender in any "humanly relevant" sense, and that's why they use "it" in such cases. The fact remains that they do *not* use "it" to refer to even semi-adult human beings, and English-speaking humans beyond the age of five do not accept being referred to that way. (If you know one who does, I'd like to

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discuss this matter with it.)

A somewhat stronger, but limited, case was made for "they"—and that's where my new question begins to emerge. One reader cited several definitions and numerous examples from the Oxford English Dictionary to illustrate six centuries of actual use of "they" or its appropriate case-forms to refer to persons of indeterminate gender (nearly all of them with antecedents already made vague by words or prefixes like "any" or "some").

I am especially indebted to Dr. William J. Sullivan, professional linguist, for an extensive and stimulating exchange on this subject. Dr. Sullivan claimed that my arguments in favor of using "the indefinite *he*" were invalid because they were based on a rule created by grammarians and not accurately describing the language as it is actually used. Such arguments, he said, are analogous to using phlogiston to explain combustion. I don't buy the analogy, because linguistic rules, whether read from grammar books or induced from observations of what people actually say, do not have the same kind of rigor or universality as physical rules. But I very much agree that there is often a gaping chasm between what the rule books of a language say and what its ordinary speakers actually *do*. (I recall once, while waiting in the lobby of a concert hall, hearing a woman call out to her companion, "That must be she!" Whereupon I remarked to *my* companion, "That must be an English teacher"—since it's quite rare to hear anyone else actually talk that way outside a classroom.)

Dr. Sullivan and some of his students made an empirical study of what people actually used as a pronoun to replace indefinite and negative terms like *someone* and *no one*. In a sizable majority of cases, what they heard was "they." This is hardly surprising; I listen to real people, too. Dr. Sullivan claims these observations demonstrate that "the real rule here is that English already has a generic pronoun, and it is *they*." Like the other reader I've already mentioned, he also mentions that we have records of such usages spanning several centuries.

I'll skip lightly over the fact that "somebody" was not the kind of antecedent that started the original fuss. There the words I was replacing with "he" were "author" and "editor." Those are perceived by most people as considerably more specific than "anybody," and while many readers may be bothered by "he," my experience suggests that even Dr. Sullivan's subjects would be at least equally bothered by the sentence, "An editor must always keep their readers' sensibilities in mind." But that's peripheral to today's discussion. For now, let's stick to "they" in the situations where most people actually use it as an indefinite, genderless, singular pronoun.

The data collected by Dr. Sullivan and his students surely prove something at least *close* to what he claims—but I don't think it's quite that simple. I said earlier that linguistic rules don't have the same kind of rigor or universality as physical laws; just what do I mean by that? Coulomb's law states that *any* time you have two pointlike charges a

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given distance apart, a certain force will act between them which depends in a rigorously defined way on their charges and separation. No exceptions. The pronoun data, on the other hand, even in a fairly small example, *did* show exceptions, not attributable to observational error. While *most* speakers *usually* said "they," *some* of them *sometimes* said something else. The rule derived from the observations does *not* describe "The Way It's Done in English." It does describe one of the *commonest* ways it's done in English, but a full and accurate description of "English" must reckon with the fact that there are other ways, too. Different people do it differently under similar circumstances, and the same person may do it differently under different circumstances.

In school and on the playground, for instance; or in speech and in writing. One of the facts that a full empirical description of English must deal with is that its schools commonly teach that *they* is "wrong" and *he* is "right" in

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First issue of *Astounding* January 1930. ©

ADVERTISING OFFICES
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Analog Science Fiction/Science Fact (Astounding) is published every 28 days with special issues in January and July by Davis Publications, Inc. at $2.50 a copy in U.S.A., $2.95 in Canada. 1 year subscription for $34.95 in the U.S.A. and possessions, in all other countries, $39.65 payable in advance in U.S. funds. First copy of new subscription will be mailed within eight weeks of receipt of order. When reporting change of address allow 6 to 8 weeks and give new address as well as the old address as it appears on the last label. Second-class postage paid at New York, NY, and at additional mailing office. Canadian 3rd class postage paid at Windsor, Ontario.

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POSTMASTER: SEND to ANALOG SCIENCE FICTION/SCIENCE FACT (ASTOUNDING) P.O. BOX 7061, Red Oak, IA 51591.
IN CANADA RETURN TO 1801 SOUTH CAMERON, WINDSOR, ONT. CANADA N9B 3E1
Editorial and Advertising: Analog Science Fiction/Science Fact, 380 Lexington Avenue, New York, NY 10017
Subscriptions: Analog Science Fiction/Science Fact, P.O. Box 7061, Red Oak, IA 51591.ISSN 0161-2328

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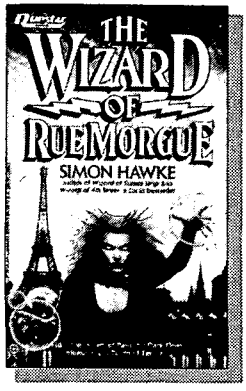

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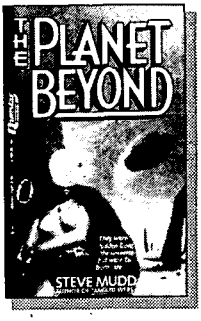

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A WORD FROM Brian Thomsen

The *Rue Morgue*, a setting for the latest work by Simon Hawke (and of course Edgar Allan Poe last century) is filled with mystery, history, and legend... and, most importantly, it's a real place that you can visit even in our technologically deficient and magically lacking time.

Reality is very important to me (contrary to popular belief, I don't consider my official residence to be Twilo). We have to be able to believe an author's world enough so that we consider it worthwhile to suspend the disbelief that exists around the fringes (a.k.a. demons, aliens, or super-intelligent species that are not human).

One day I hope to go to the *Rue Morgue*... but until then reading about it is enough. *Arigato!*

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the situations we're talking about. Of course, some of them also teach that dangling prepositions and split infinitives are categorically wrong—but that's another debate! On the other hand, some schools and textbooks also recognize the existence of different "levels" of language, and different standards for colloquial speech and published writing. Even people who often *say* "they" in a singular sense will balk at it in writing (perhaps, admittedly, because of their classroom conditioning). That is why writers and editors who wish to minimize reader resistance must be wary of using it (except in dialogue).

No two people speak quite the same language. "You say to-may-to and I say to-mah-to. . . ." People at the two extremes of the abortion controversy may never be able to agree because they understand fundamentally different things by the term "human being." Yet in some sense it is possible to define a category of individual speech patterns which are similar enough to call "the English language." But what *is* English, and how do we decide? Is it what Authorities who write books and teach classes decide it should be? Is it what a linguist eavesdropping on lots of conversations hears most often? Or is it neither of those—or both? Whatever it is, does it or does it not have that generic, gender-neutral pronoun?

It seems clear to me that we're really dealing with at least two groups speaking different languages: the English teachers and textbook writers, and the men and women on the street. If, as Dr. Sullivan and his students found, the common practice of the latter is radically different from what's being taught by the former, why should we pay any attention to the former at all?

And *that* I find a *really* interesting question that deserves serious consideration in circles where it hasn't had much. On one hand, we do need some sort of common linguistic currency; and schools, unsatisfactory as they may be, seem one of the best available mechanisms for creating and maintaining one. That need is stronger in other parts of the world, where dialect variations are more extreme than they are in English, but even here the need exists. On the other hand, why are these "authorities" taken seriously when the language they are teaching is not really the common currency of many people except themselves?

One thing we may be able to agree on is that English does *not* have a *generally accepted* pronoun of the kind I suggested it needs: one that can be freely used to refer to one adult human being of unknown or irrelevant gender without causing confusion, anger, or accusations of error among any sizable group. If it did, this controversy would not have become so voluminous or still be going on. What English does have where that pronoun belongs is one convention accepted by one large group, and another accepted by a smaller but still sizable (and disproportionately influential) group.

And that fact raises larger, and I hope disturbing, questions. In matters like this, just how much weight should be given to "authority," "consensus," or both? And why? ■

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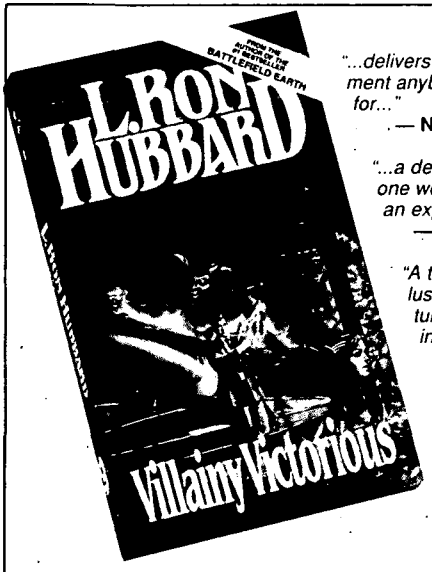

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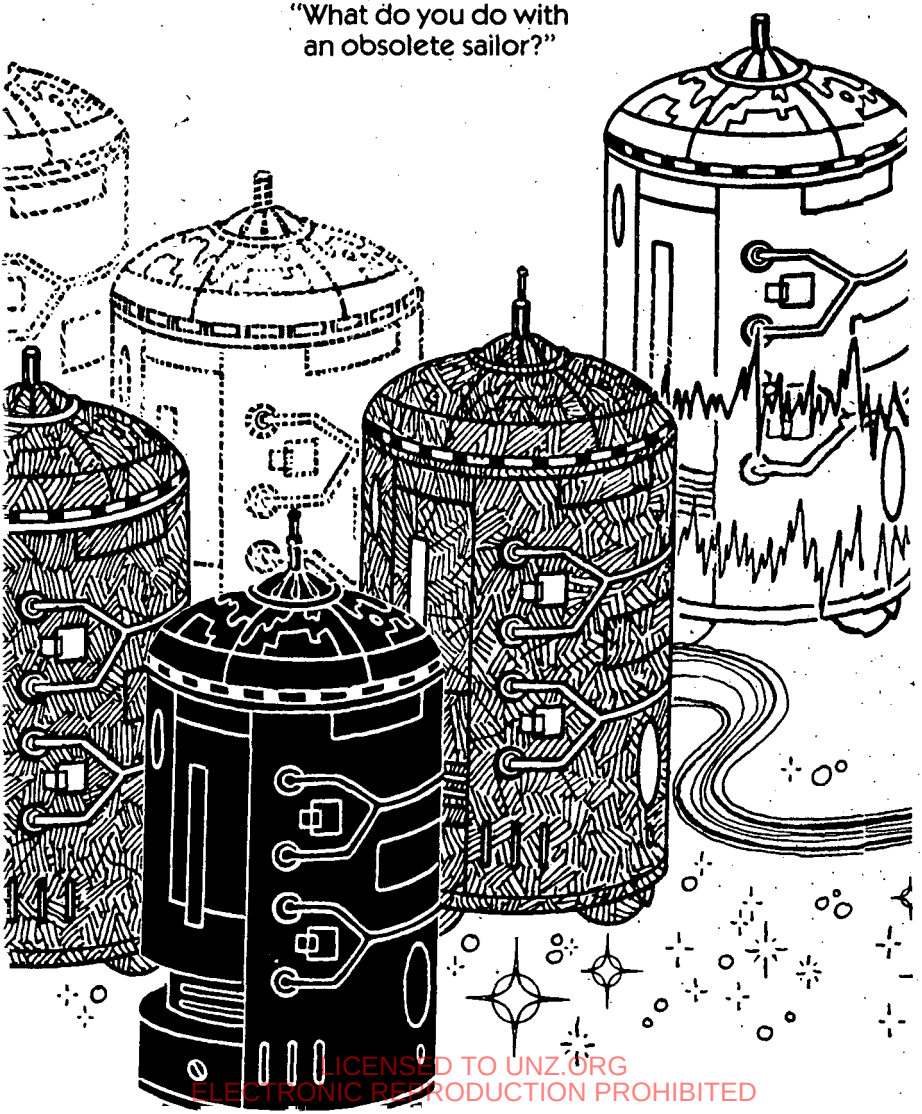
HEROES

Maya Kaathryn Bohnhoff

As the old song almost says,
"What do you do with
an obsolete sailor?"



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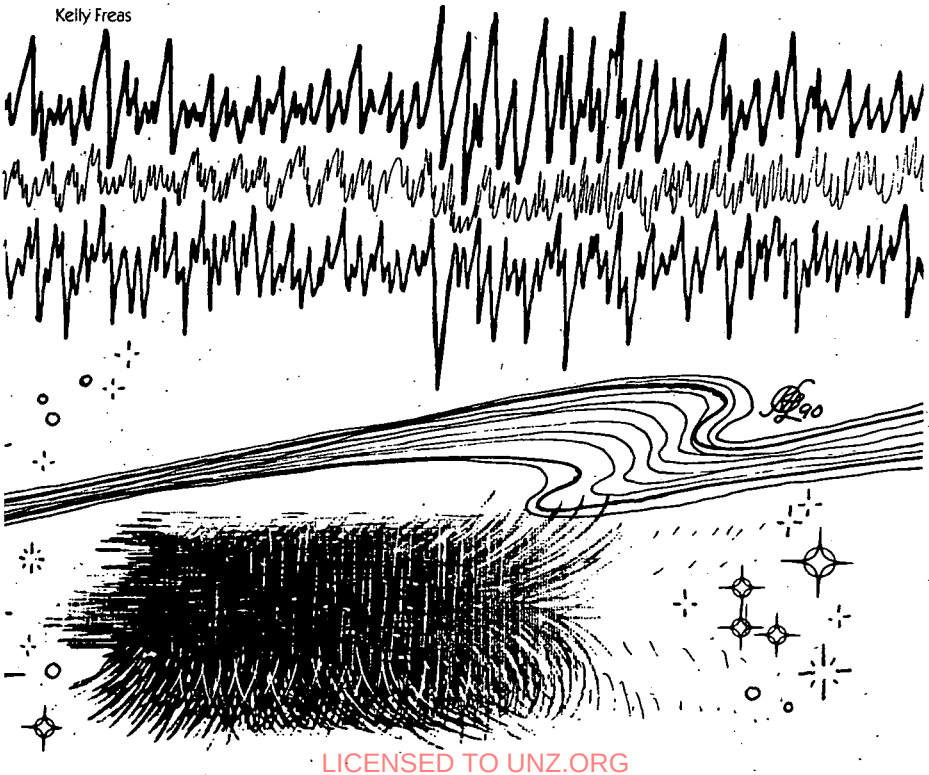

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There was silence in the Operating Room except for Shiro Tsubaki's soft voice counting elapsed time. Behind the broad expanse of duo-glass that looked down on the Theater, the technicians' faces flickered with reflected data from their computer displays. The video monitors each showed the scene from the Theater below—a static scene in which a small cylindrical robot sat in a shimmering field of dancing motes.

Trevor Haley watched the same scene through the window, waiting tensely for something to happen.

"Shifting," said Shiro's voice.

Trevor blinked, his eyes straining to [redacted] any change in the bot. There was [redacted]hange, all right. The little machine's solid lines began to waver and bleed into the shimmer around it. Before he could blink again, it was gone. He pulled his attention back to his console.

"Shifting to Green minus one," said Shiro. The counter on her monitor ticked off a series of numbers that looked like seconds, but were not. "Shifting Aqua minus one . . . " Another silence followed. "Shifting Blue minus one . . . minus two. Stop shift at . . . Blue minus six. That's negative thirty-six."

Someone said, "Wow," and the entire operating room breathed a sigh of relief.

"Halfway there," murmured Magda Oslovski. "Five minutes, Shiro."

"Counting."

Oslovski shifted in her seat. "Video status?"

"Fully functional." George Wu shook his head, trying to clear the sense of unreality. "The video carousel is at 30 degrees. We ought to have some great footage."

"Let's hear Toto's stats, Trev."

Trevor stirred. "Temperature: 18 degrees Celsius; humidity: 60 percent—a little higher than normal for the time of year; attitude: 5 degrees from upright and adjusting."

Oslovski nodded. "It'd be nice if we could maintain video contact."

George Wu snorted. "Right. Maintain an optic link across a temporal spectrum. Piece of cake."

"There was a time," said Oslovski in her when-I-was-an-eager-young-scientist voice, "when an optic link between *cities* was science fiction. Now it's just science—*old* science. Mark my words, George, given enough time—"

"Movement," said Trevor. "Thirty degrees, three meters distance. Object reads . . . less than a meter in height, about a meter long. Damn, I wish we could see . . . " He peered at the shifting readings on his display. "This is weird. The object is moving and *part* of the object is moving independently. Closing to two meters. Independent movement is rhythmic, uh . . . It's like, uh—" He waved his hand back and forth.

"Someone waving?" suggested Shiro.

"One meter tall?"

"Not waving, *wagging*," suggested George. "It's a—it's a dog!" He shrugged when everybody turned to look at him. "Well, it *sounds* like a dog."

"Object at one meter."

"You know if that *is* a dog," said George, "it just might mistake Toto for a fire hydrant."

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Oslovski grimaced. "Great. We may get to see how well he withstands precipitation."

"I don't think that's what the Techs had in mind," George murmured.

"Two minutes," announced Shiro.

They continued to spout data intermittently for another three minutes, watching the progress of the "doglike object" carefully. At the end of a full five minutes, Oslovski gave the order to reverse the field.

"Reversing field," announced Shiro.

Trevor laughed. "Object radiating percussive audio vibration and receding rapidly at 30 degrees."

"Ah," said George. "What is the sound of one dog barking?"

"Shifting to Blue minus one," said Shiro. "Aqua minus ten . . . And Green minus ten, nine, eight, seven, six, five, four, three, two, one and zero."

Every eye in the room went to the monitor that displayed the contents of the Theater. In the shimmering field, the bot appeared, looking no different than it had when it left.

"Welcome back to Oz, Toto," someone murmured.

The O.R. exploded in a spontaneous cheer. Hugs and laughter and silly dances followed in a ritual celebration of accomplishment so ancient it had probably marked the creation of the first successful Folsom point.

It lasted for all of thirty seconds. Then the backslaps dwindled to pats, the laughter died to throat-clearing coughs, the flushed faces drained of color and hilarity. Six pairs of eyes swung to Magda Oslovski.

She read the question in them and sighed, feeling suddenly and incongruously depressed. "OK," she said. "We did it. Presumably we did it successfully. Now we gather up our data and study it. We write our lab reports and . . . and move on to Phase Five."

People looked at their shoes. People looked at their handcomps. People frowned.

"Magda," said Trevor Haley tentatively, "when are we going to report to the Chiefs? You've been holding them off for the better part of a year with 'steady progress is being made.' We've shown them disappearing orange tricks and talked about it being years before we dare Shift human subjects. At some point they've got to be brought up to date."

"I have *not* been holding them off. I've been . . . cautious. Do you think we should let them in on all phases of the Project?"

"I didn't say that. I just . . . wondered—"

"When the axe was going to fall?" asked Shiro.

"Falling axes have to do with being fired," George reminded her. "I don't think for a moment the Chiefs are going to let us get off that easy."

"No, they're not." Oslovski scratched at the edge of her handcomp with a well-manicured thumbnail. "In fact, General Caldwell and company are due here next Monday to check in on us. I didn't tell you before," she added over a chorus of protests, "because I knew it would affect your work . . . and your health." She looked up. Her eyes had that steely look she was famous for. "I haven't decided how much we're going to tell them yet. Gather up your goodies, people. Staff meeting in half an hour."

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Thirty-five minutes later, a subdued group congregated in the Level 3 conference room and took their places around its large oval table. Magda Oslovski was the last to arrive. She seated herself at the head of the table and called the group to order.

"All right, folks. I'm going to turn this over to George and company for show and tell. George?"

George Wu popped a video disc into the console set into the tabletop before him. He glanced at his assistant, Louis Manyfeather, then threw the rest of the group a nervous grin. "I've got to admit, we peeked," he said. "This is great!"

He started the playback. Around the table, video displays came to life. The title screen showed first: Project Hourglass—Phase Four—4/21/24. Then they saw a dewy sward of close-cropped grass from roughly the vantage point of a four-year-old child. About four meters distant, a border of evergreen shrubbery blocked their view of a variety of tree trunks.

The video image panned slowly, showing more of the same. Through the trees a building came into view—low and squat and square and composed predominantly of greenish tinted glass and strips of pink granite. The image panned along the building further. Then something else came into view. A chuckle rolled around the table.

"There's your 'doglike object,' Trev," said Shiro. "I think it's an Airedale."

"Told you so," said George.

The Airedale disappeared as the video unit continued its sweep. They saw more grass, a metal sprinkler head, the roof of another building.

"Wait! Pause that!" said Oslovski. "That's the roof of the library building, isn't it? You can't even see that from here, now."

Heads nodded absently. The slow pan continued and concluded, and the screens went dark. Toto's audio recorder let out a wild yelp and a short series of barks. There were a few chuckles.

"Now," said George, "Louis hit the archives and came up with this." He slid a second disc into the unit. The displays lit up again with a still shot of a very similar scene. "This is the campus thirty-five years ago. The photo was taken from the steps of what was then the psychology building. That lawn is now covered by this facility. The white 'x' in the grass marks the spot in the O.R. where Toto was Shifting." He paused, ran a hand through his thick, black hair. "Ladies and gentlemen, we just sent Toto back thirty-six years in time. Chances are we can just as easily send him into the future."

There was a moment of hushed appreciation while seven people tentatively explored the wonder of what they'd just done. Trevor Haley put a damper on the wonder.

"Our masters aren't interested in the future," he said drily. "They're interested in the here and now."

Magda Oslovski sighed and took off her glasses, laying them on the table with a solid click. Most people considered her glasses a scientist's professional affectation. The state of medicine being what it was, there was no reason for anyone to ever have to suffer glasses again. They were, in fact, more expen-

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sive than the corrective surgeries available. Oslovski was hard put to make anyone with 20/20 vision understand the mental benefits of being able to make the "real world" go out of focus at will.

The faces of her team were just fuzzy enough that she couldn't read their expressions. That was good, considering what she was going to say.

"As I mentioned previously, General Caldwell and the Joint Chiefs will be here next Monday. What that means, folks, is that he's expecting a full report on our accomplishments to date and probably some sort of whiz-bang demonstration. He will, no doubt, be very pleased with today's progress. And, if the milestones continue to be met, we may have positive reports to offer on Phase Five as well."

"Oh, joy," said Shiro, with nothing like joy.

"Do I need to remind you that we are under contract to the Department of Defense and are bound by that contract to deliver the fruits of our research?" Oslovski eyed the fuzzy faces.

A combination of mumbles and groans circled the table.

"All right. We've penetrated Negative 36. We're going to march back into our operating room, recalibrate our equipment and repeat Phase 4. This time we'll turn the clock back a little further—see if we can't extend Toto's leash into the Violet range. And I want scrapings from his casing to go to analysis for any signs of fatigue." She glanced down at her wristwatch, grimaced, put on her glasses and glanced at it again. "Let's take a lunch break. Meet in O.R. in an hour and a half."

* * *

Shiro dug her fork viciously into the lettuce on her plate, got too much and worried the excess off the tines.

"This whole situation stinks like yesterday's garbage," she said. "How can we just go merrily along with our research when we suspect it's going to be used to change history?"

"We're under contract." Trevor mimicked Oslovski.

"Huh! A contract with the devil." Shiro bit into a radish.

"It's not that bad . . . is it?" asked George. "I mean, we don't know that they intend to use it for anything heinous. They said they wanted to go back to strategic points in time to—to—"

"Meddle," said Trevor. "Oh, I know, I know—that wasn't the official language. What was the wording they used? Oh, yes—'rectify and enhance.' As if there was a whole lot to enhance. There hasn't been a war on the globe for close to fifteen years. No communists have slunk up the continent from South America, no petty dictators have reared their ugly heads—successfully, at any rate—and the so-called Super Powers are behaving like kissin' cousins. How the hell do you enhance that?"

"Ah," said Shiro, waggling her fork at him. "*That's* the whole point! One man's poison is another man's dessert. What is good for the world does not necessarily seem good to all the officers and gentlemen being put out of work by what is good for the world. Nor vice versa. For years there has been talk about combining the military branches and putting them under the control of the National Guard and the United Nations. More military bases are closed

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every year. You know they feel the squeeze."

"And you think," asked George, "that *that's* what they want to rectify? The shortage of wars?"

"They're soldiers, George," said Trevor. "Soldiers are trained to fight enemy soldiers. With enemies in such short supply, there's not a whole lot for them to do these days. And the money that was used to buy them technological gadgets is now fighting disease and pollution, feeding people and funding space stations."

"So, then the question arises: *Why* are they spending the last measly megabucks of their dwindling budgets on time travel?" Shiro asked.

"Maybe," suggested George, "they want to go back to a simpler time when being a soldier was an honored profession instead of something you have to apologize for in polite company."

"I wish that was it," said Trevor. "But I'm sure it isn't. If we hand them the past, we're handing them the future right along with it. *Our* future —everybody's future. It scares the hell out of me."

Shiro nodded, her mouth full of salad.

"OK, me too," admitted George. "But what can we do about it? We're just the hired hands. And, as Magda pointed out, we're under contract. The reputation and survival of QuestLabs is riding on our fulfilling our obligation to the Defense Department."

Shiro grimaced and pushed her plate aside. "There's a heck of a lot more riding on it than that."

The sequel to the Phase Four experiment was as successful as the original. Oslovski's team sent Toto (Totable Temporal Oculus) back over four decades. With the exception of smaller trees and the presence of a gardener and a few dorm-dwelling students (which shortened Toto's planned stay of ten minutes), the scene was much the same as it would be nine years later.

There were no cheers this time upon Toto's successful return, although the team's junior members, Manyfeather, Khadivian, and Walsh, did exchange a "high five."

Afterward, Magda Oslovski barricaded herself in her office, ostensibly to draft a report for the Joint Chiefs. What she did instead was sit in the glow of her computer terminal, staring at the data through unfocused eyes. She took her glasses off, finally, and rubbed her eyes, then swore when she realized she'd just turned her eye makeup into brown and black smudges.

She was almost relieved when her three senior researchers violated the "do not disturb" message she'd left on her hall monitor. They collected before her desk like recalcitrant kindergartners, managing to look defiant and apologetic all at once. George Wu sat, Shiro Tsubaki perched on the arm of his chair, and Trevor Haley stood behind them, hands buried deep in the pockets of his blue lab coat.

"Have you been crying?" asked Shiro.

Oslovski shook her head and put on her glasses. "No, not yet. Are you going to make me?"

They smiled with all the sincerity of the second runner-up at a beauty pageant.

"Come on people, let's hear it."

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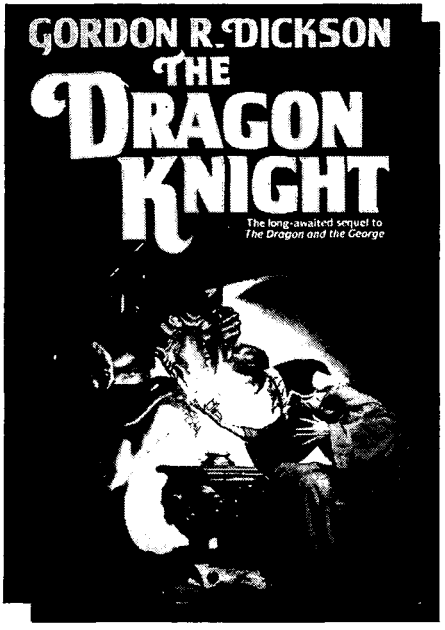

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Now they exchanged nervous glances. Trevor cleared his throat.

"Magda, we. . . . we're in a real dilemma over this project. Or rather, over the use we're afraid the results of this project will be put to."

"Frankly, the language of the contract bothers us," said Shiro. "We're very concerned about the morality of our position."

Oslovski was nodding. "I can't say I wasn't expecting this. I can't say I wasn't dreading it, either."

"Don't you have any feelings about it?" asked Trevor. "Doesn't it scare you to think what a group of men facing the extinction of their way of life might do with time travel?"

Oslovski made a peaked roof with her fingers and studied the long, natural fingernails. "Before I say anything about my *feelings*, I have a duty to deliver the party line."

They groaned almost in harmony and she held up her hand. "Hear me out, please. I've got to say this. We are not the first scientists to be confronted with this dilemma. Psychologists even have a name for it—the Oppenheimer Syndrome. Science is neutral—neither good nor evil. Only the end uses of science can be viewed through a filter of moral principles or ethics. You know all this; I'm not telling you anything new." She got up and began a deliberate stroll around her office. "Party line, folks, is: We are not culpable for the actions of the people who purchase our expertise or the fruits of our research. We make time travel possible and our responsibility ends there. We aren't accountable for what's done with it once it leaves this facility."

"But, dammit Maggie, it *doesn't* leave this facility!" Trevor moved to follow her. "Don't we have anything to say about that? Do we have to be associated with their . . . historic enhancements?"

She stopped to look at him. "Are you suggesting we cast them out into the world with our research notes and wash our hands of the technology? Give them the recipe and make them find their own cooks?"

"We could do that, couldn't we?" asked George hopefully.

Shiro shook her head. "We were talking about morality, George. Is that any more moral than doing the work ourselves? Given our research, they could find other people to do the work. The world would still be up the tree without a paddle."

"Creek," corrected George.

"Creek, then. . . . I feel we should keep the technology in-house and exert some control over how it's used. Can't we do that?"

Oslovski shook her head. "I don't see how."

"OK, Magda," said Trevor. "You recited the party line. Duty is done. Now, tell us how *you* feel about this."

"Very uneasy. Close to crappy, in fact." She circled back toward her desk. "General Caldwell has been extremely close-mouthed about the reasons the military community has targeted Temporal Research for support. I'm not terribly comfortable with phrases like 'enhancing history' or 'rectifying cultural aberrations.' " She was back at her desk now, and seated herself behind it. "Fact is, folks, we are bound by contract to deliver the 'fruits of our re-

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search,' as the papers say, to our clients. Fact is, our administration will hold us to that contract regardless of our moral inclinations. Let's say we default—refuse to continue. Best case, they take the body of our research and use it without our cooperation, maybe even ban us from further work on time travel."

Shiro gasped. "Could they do something like that?"

"Read the contract, Shiro. It gives them the right to the disposition of Temporal Shift technology."

"So what's the worst case?" asked Trevor.

"Worst case is, they do all that and bury this whole institute in the bargain."

"So we're powerless over our own creation, then. That's what you're saying. We can't do a damned thing." Trevor's fists threatened to rip through his pockets. "Jesus, Magda, can't we do *something?*"

Oslovski took off her glasses and rubbed the bridge of her nose. "You ever read Saint Francis of Assisi?

Shiro nodded. George and Trevor shook their heads.

"Saint Francis wrote a prayer that went something like this: 'God grant me the courage to change the things I can, the serenity to accept the things I cannot change, and the wisdom to know the difference.' "

"That's an answer?"

She shook her head. "It's a . . . yardstick. If we start with wisdom, maybe we'll be able to determine whether the situation calls for courage or serenity. Right now, my best advice is to accept the situation as it stands and pray for a sign from God."

They weren't happy with the advice, she could tell that by their glum faces as they filed out of her office. She felt sorry for them. Hell, she felt sorry for *herself.* She couldn't even go holler on their administrator. She and Peter had already been around the proverbial rocket silo with her ethical objections to letting the military lead her research team around a blind curve. He'd reminded her about the sacred neutrality of science.

"Screw the sacred neutrality of science," she'd said. "Neutral is not a synonym for amoral."

"You're a professional," he'd said. "I know you understand that there are also business ethics involved. Make your people understand. And make them understand that their temporal research would have died on the vine if the Defense Department hadn't gotten interested in it."

"Screw business ethics," she snarled, as she threw herself onto her living room sofa that evening. "Since when are business ethics more important than human lives? Since when are they supposed to count for more with scientists than-than moral integrity?"

"Since businessmen started managing scientists?" Her husband poured her a cup of coffee and handed it to her.

She grimaced. "God, yes. Bottom line . . . party line. Contractual obligations and scientific neutrality. And I, dutiful parrot that I am, read it right off the cue cards to my team. You should have heard me, Vance. I actually quoted Saint Francis of Assisi to them." She sighed and sipped her coffee. "The poor man is probably spinning in his grave."

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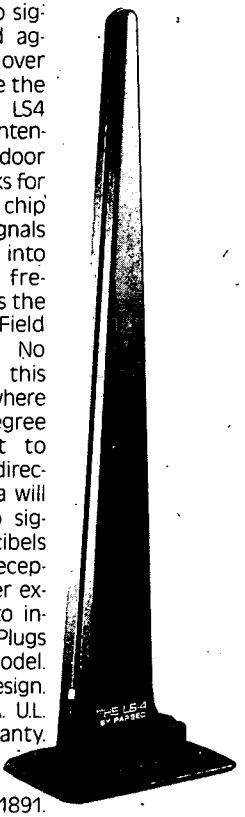

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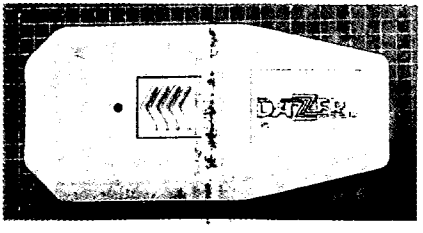

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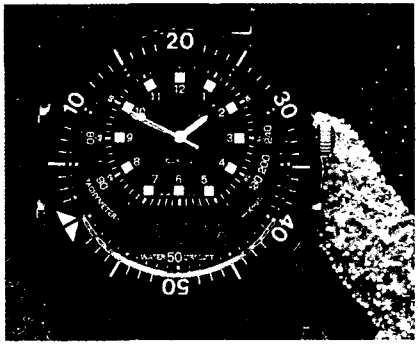

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Vance smiled. "I would have quoted Galata."

"Galata?"

"One of my ilk—a psychologist. He said that human beings who fail to adjust their situations will be forced to adjust their attitude toward that situation."

"Meaning?"

"Well, in the case of your crew, it may mean that they'll adapt by developing a thicker skin. Maybe focus on the technology itself, on the, ah, scientific esthetic as opposed to the moral ethic."

"I smell an 'or' in there somewhere. Faced with an unchangeable something they either adjust their attitude or what—go crazy?"

He shrugged. "That has been the reaction of some minds to unbendable obstacles."

Magda shook her head. "No! Dammit, Vance, my team should *not* be the ones to have to adjust their attitude! It's precisely because the military won't accept and adapt to its dwindling sphere of influence that we're working on this project."

"Mm-hm. Precisely. Because of their inability to adapt, they're funding your life's dream."

She glared at him, thinking that there was a definite dark side to being married to the team shrink. "That's it, Mr. Psychologist. Make me feel like a self-centered, spiritually bankrupt toad."

"Everyone's self-centered, Mags. It's a perception we learn to adjust as we realize the Universe does not revolve around us."

"Only some of us don't adjust very well."

"Don't be too hard on yourself. At least you realize there's a dilemma."

That was not enough consolation to give Magda Oslovski a good night's sleep. She arrived at work feeling limp and run down. A glance at the faces of her senior staff revealed matching sets of dark circles under their eyes. Louis Manyfeather and Vahid Khadivian looked more well rested, but they were unusually quiet as they went about readying Toto for his morning outing. Judy Walsh was almost surly.

Oslovski gathered Haley, Tsubaki and Wu for a review of the previous day's data. They were business-like (she was beginning to hate that word) and muted, answering questions in monosyllables and sharing sullen glances. They were on their way down to O.R. when she was paged to take a phone call from Washington. Three pairs of eyes assaulted her.

She held them off with a shake of her head. "I'll handle this," she said.

"Handle it, how?" asked Trevor.

She grimaced and crossed her fingers. "With wisdom, I hope,"

It was Caldwell, of course, wanting an unofficial report in anticipation of the official one he'd receive along with the other Chiefs the next week.

Oslovski licked suddenly dry lips. "We're . . . we're doing very well here, General. In fact, we . . . we've successfully completed Phase Three of the project." She was glad she had the video link off and he couldn't see her face.

"Phase Three? Ah, yes! That would be the short jumps into the past."

"Yes. We sent Toto—the Temporal

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unit—back in time in increments from one hour to one year and successfully retrieved it, of course. After a thorough study of the data we included a compartmented cage containing several varieties of insects. They survived and we were then able to send mice."

"Which also survived?"

"Yes, General. Although we're still monitoring them for side affects. There did seem to be some disorientation. You can never be too careful with live animals."

"Oh." He sounded disappointed. "Then you haven't sent a human being anywhere yet."

"Of course not. That would be premature . . . Of course, it's only a matter of time."

"If you need a volunteer—"

"No, General. We do not. It's too early."

"Hmmm. So the next phase, then —Phase Four—that's where you'll shoot for longer backward jumps?"

"Yes. We'll extend both our stay and our range. It should be . . . exciting." (It would have been if you hadn't been footing the bill, she thought.)

"How far back?"

"Uh, we, um, had plans to attempt a jump of several decades."

"That's excellent, Dr. Oslovski. That is precisely the time period we're interested in for *our* first experiment. We need to know as soon as you can send a man back thirty-two years *and* put him wherever we want him."

"Well, spatial displacement is part of the n—of Phase Five."

"Excellent. Is there any chance you'll be at that level by next Monday?"

"Uh, there is a slim possibility."

"Outstanding. Then I'm going to give you a target, Doctor. A time and a place to shoot for: April 21, 1992, New York City, World Convention Center, Main Hall, Upper Deck."

Oslovski frowned. "Is there a particular reason for that target? Or is that something I'm not permitted to know?"

"I can only reveal the general nature of the mission, Doctor. There was a major snafu in New York in '92. We want to . . . set it right."

"Sounds . . . earth-shattering."

"Oh, it will be." There was more than a little pride in that statement.

Oslovski was online to the Data Library within seconds of breaking the connection with Caldwell. She instituted a search for significant events connected with the date he'd given, knowing full well what she was going to find.

"First World Congress," returned the computer in well-modulated tones.

"Location."

"World Convention Center, New York."

Oslovski rolled her eyes. "Just this once, I couldn't be wrong?"

The computer didn't respond.

"Um, detail, please. Significant occurrences connected with the World Congress."

"Admittance to Euro-Commonwealth of the Soviet Democratic Republic of the Russias, Poland, Hungary, Czechoslovakia and Rumania. Euro-American Alliance formed, including broad-based arms agreement and Demilitarization Pact. Continue?"

"Demilitarization Pact—didn't that have a huge impact on the military establishment?"

"Affirmative. The Pact formalized

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the removal of American forces from Northern Europe and was the beginning of the ongoing dismantling and consolidating of the super-powers' armed forces. The Pact was signed on the second day of the World Congress by the Presidents George Bush and Mikhail Gorbachev."

Was that the snafu? The signing of the Pact? "Library, were there any negative occurrences at the conference? Any . . . scandals, things of that nature?"

"Affirmative. On the first day of the Congress, an attempt was made to assassinate President Gorbachev. It was foiled by the United Nations Guard."

Oslovski felt a chilly fist grasp her stomach. "Detail," she ordered.

"The attempt was made during a televised speech. The assassin was discovered as he was preparing to fire. The shot went wild. No one was injured. The President was escorted to safety. However, the assassin was shot while trying to escape. Members of the U.N. Guard denied responsibility for the shooting and a cursory examination revealed that the bullet came from a variety of long-range weapons not used by the U.N. forces. The assassin's body was destroyed in a fire before a complete autopsy could be performed. Arson was suspected. Destruction was complete."

"No teeth?"

"Specify."

"Weren't the assassin's teeth found? Couldn't they check dental records?"

"Negative. The assassin was apparently wearing a dental plate made of meltable plastic. Analysis of the residue yielded no information. Identification was never made."

Oslovski sat quietly, stunned. Was *that* it? Was that the general's "snafu?" Two possibilities occurred to her simultaneously. One was that the military meant to keep the assassin from being killed so the conspirators could be discovered. That was laudable. But since President Gorbachev had survived, what was the point at this stage in history?

The other possibility . . .

"Library. Ramifications of attempt on Gorbachev's life—analyze."

"The success of the U.N. Guard in protecting the President forestalled a major socio-political disaster. The United Nation's position in the Congress and subsequent conferences was strengthened and Soviet-American relations cemented. Both the U.S. and U.S.S.R. expressed outrage at the destruction of the assassin's body, which was in the custody of a naval hospital. The investigation that followed was a joint Russo-American effort."

"Further analysis: Impact of these events on the role of the U.S. military in the world sphere."

"The handling of the assassination attempt by the U.N. forces and the subsequent charges of negligence brought against certain naval personnel was a factor in diminishing regard for the military establishment. The ineffectiveness of the military in handling the situation with Gorbachev made the accords signed by U.S. and Soviet leaders regarding military decommissions much more tolerable to the American people. Political figures who had stood behind a strong military abdicated that position faced with what was perceived as a scandal."

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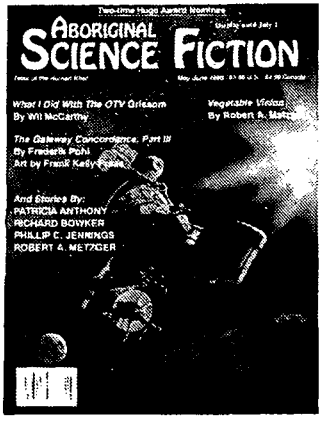

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Oslovski frowned. "Question: At the time the assassination attempt was made, had either Gorbachev or Bush signed any agreements significantly affecting the military?"

"Negative. As previously stated, the attempt took place on the first day of the conference at precisely 11:00 A.M."

Oslovski had one last question—one she was more than a little afraid to ask. "Was . . . was the military in any way . . . implicated in the assassination attempt, or was it just a question of negligence?"

"There were no formal charges made, although there was some speculation that the situation involved more than negligence. The arrangements for security were handled directly by a committee made up of high-ranking military officers."

Oslovski sank back into her chair. *This has to be wrong, she thought. I have to be wrong. This can't be what it looks like.* It was inconceivable that intelligent human beings could be capable of something so impossibly evil as attempting to kill, not just a man, not just a country's leader, but world peace.

She got up and went down to O.R., her brain ticking like a jelly-filled time bomb.

The team was waiting—not very patiently—and nearly mugged her when she came through the door. She waved them down. "Yes, it was Caldwell. We . . . we have things to discuss—after we start Phase Five."

Trevor made an exasperated sound. "Why? Why can't we talk now?"

"Because. . . . Because I need to launder my brain. I need to be scientist for a while." (And because I'm half hoping Phase Five will flat out fail and buy us some more time, she thought.) "Places, everyone."

They went without argument, slid into their duties and performed them flawlessly. Toto was sent backward in time to several sets of spatial coordinates that had verifiable landmarks. The experiment was a complete success. That generated some excitement, but not nearly what it should have.

At 1:00 P.M., Magda Oslovski looked over the body of data, gritted her teeth and called a staff meeting.

"As some of you know, I talked with General Caldwell this morning," she told the assembled team. "He and the Joint Chiefs of Staff will be here in six days to see what progress we've made on Project Hourglass."

"We've made wonderful progress!" enthused Vahid Khadivian. "Did you tell him that?"

Everyone else glanced at Khadivian, glanced at Oslovski, then studied their blank video displays.

Oslovski started to take off her glasses, then changed her mind. She had to be able to read them accurately now.

"First, I'll tell you what he told me. Then I'll tell you what I told him. He gave me a target time and location. New York City, 1992, April 21, World Conference Center."

"Oh! First World Congress," said Shiro. Everyone else nodded.

"Correct. The general informed me that a . . . snafu—a major mistake—had occurred at this time and location. One the Joint Chiefs wanted to rectify." She engaged the computer. "Library. Display headlines pertinent to the incident on the first day of World Congress."

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The computer produced the front page of a New York newspaper with a banner headline: ASSASSINATION ATTEMPT AT WORLD CONGRESS—GORBACHEV UNHARMED.

"The assassin was shot and killed," said Oslovski. "His body was destroyed by a suspected arson fire while in the keeping of a naval hospital and under a US military guard."

"Was that the mistake?" asked George. "The assassin's death and the destruction of his body?"

Oslovski shook her head. "I don't know. Let's see what you think." She filled in the details then—slowly, carefully, using the computer as part of her presentation. When she finished, there was a heavy, disbelieving silence.

Trevor Haley broke it. "Do you think they intend to make sure the assassination attempt is successful?"

Oslovski shrugged and spread her hands. "I hate to think it, but it looks that way to me. The other possibility doesn't make sense. Frankly, it sounds as if the assassin surviving his capture would *really* throw a spanner in the military machine."

"What did you tell Caldwell?" asked Shiro.

"I told him we'd successfully completed Phase Three."

Khadavian and Walsh both blanched.

"Phase Three?" repeated Vahid. "But that's not true. We've completed Phase Four."

Oslovski shook her head. "I did not lie to the man, Vahid. I merely underxaggerated. We *have* completed Phase Three."

"But when they check our reports—" said Walsh.

Oslovski held up both hands. "Forgive me, Judy, Vahid, but that is simply not important right now. We have a major moral dilemma on our hands. I trust I'm not the only one who feels that way."

A chorus of negatives indicated she was not. "I know I read some of you the party line yesterday—all that about the neutrality of science. Well, folks, science may be neutral, but scientists can't afford to be. *Mankind* can't afford for us to be." She stood up and put both hands flat on the table. "All right, the situation is this: I suspect that the Joint Chiefs intend to use our technology to go back to the First World Congress and attempt to create a situation that will also make it the *last* World Congress. Does anyone else share that suspicion?" She raised her left hand.

Haley, Tsubaki and Manyfeather followed suit immediately—George Wu with reluctance. Vahid kept both hands in his lap and looked miserable. Judy Walsh just stared at the table top, a fierce scowl on her face.

"Do you two disagree?" asked Trevor. "Do you think we're being paranoid? It seems to me we at least have reason to tread cautiously here."

Vahid shook his head. "I don't know what to think. . . . They . . . they've paid so much for this research. Without them, we wouldn't even have gotten to this stage."

"We'll all be paying for this research with our lives if they use it the way it looks like they mean to."

Vahid just shook his head again.

Judy said, "I just can't believe it. My

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father's an air force non-com. I can't believe they'd—"

"We're not talking about the whole military here, Judy," said Oslovski. "Just a group of men who . . . who may be having difficulty facing reality. Unfortunately, this group is at the top of the chain of command. . . . I can arrange for a transfer," she added gently. "If you want to opt out now, you can."

Judy took a deep breath. "No. No, this project has been my life for four years. I can't just get up and leave. And I don't want to see it used to kill. Besides, my father would be ashamed of me if I ran out in the middle of it all."

Oslovski nodded. "Vahid?"

"I'm scared," he said.

"We're all scared," said Oslovski. "The question is, do we stand around and shake and shiver, or do we do something about it?"

"I'd like to do something," admitted Vahid.

"Right." Oslovski let out a pent-up breath. "Now, given the situation, what do we do?" She looked at the group around the table.

"We could send the general and his people back to the Cretaceous and leave them there," suggested Trevor.

"Be real," said Shiro. "We don't even know if we *can* penetrate the Cretaceous."

"Seriously. Can't we strand them someplace—I mean, some time?"

Shiro shook her head. "That would be as immoral in its own way as what they might be planning. Besides, they might manage to change the course of evolution or something."

Louis Manyfeather sat forward in his seat. "What if *we* go back in time and make sure the assassin is captured?"

Oslovski grimaced. "Tempting, but none of us is exactly James Bond. Besides, that might change history just as effectively as a successful assassination. We need to make as little impact as possible on what's already happened. We need to—to change the present to protect the past. Keep them from going back at all, if possible."

"We could lock up our data," suggested George. "Tell them what they're asking is impossible."

Oslovski nodded. "I thought of that. But remember, we've already shifted back *past* their target. The computers know that. I know you're a talented programmer, George, but you'd have to be the king of hackers to destroy all that data without leaving a trail. Every activity log on every piece of equipment in O.R. will call us liars if anyone develops a sense of curiosity. Besides that, whose to say they won't just go elsewhere for the expertise?"

"But that would take years," said Louis.

"The net result would be the same, don't you see?" asked Oslovski. "Time is no object. No matter how long they wait, if they achieve their goal. . . ."

He saw, and nodded glumly.

"If we can't get rid of them and we can't fool them," said Trevor, "then what can we do? Hypnotize them so they give up and go away? They're not going to change their minds just because we think they need an attitude adjustment."

Oslovski stared at him. "An attitude adjustment," she murmured.

"What?"

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"Something Vance said last night about human nature. That presented with an unchangeable circumstance, the human mind adjusts its attitude to accept it . . . or goes mad, I suppose."

Shiro nodded. "In other words, it grows the serenity necessary to accept the inevitable. . . . But how can we make the irresistible force *believe* that it has met an immovable object?"

Oslovski raised her eyebrows. "Maybe Trev has something there—hypnotism."

Trevor snorted. "I was being facetious, Magda. There's no way we can hypnotize the entire Defense Department."

"We wouldn't have to. The entire Defense Department isn't going to be time traveling. They'll send one or two men back—hell, *we* can control that much. We'll tell them the field won't allow more than that." She started pacing, thinking. "I want to change the script for the next Phase Five experiment. We're going to send Toto downstairs."

While the others ate lunch, Magda Oslovski went up to her husband's second floor office. He was munching on a tuna sandwich when she came in clutching her coffee cup in both hands.

"Hi," he said. "Have you had lunch?"

She shook her head and he handed her half of his sandwich. "You have 'that look.' "

"That 'lean and hungry look'?" she asked around a bite of tuna.

"No. The patented Magda Oslovski 'I've come to a definite decision and God help you if you try to change my mind' look. So, what's it going to be, Saint Mag of QuestLabs: Courage or Serenity?"

"Our courage, their serenity. Before I tell you what that means, answer a question: Can you hypnotize someone to make them *think* they've done something they haven't done?"

"Can I, personally?"

She nodded.

"Ye-es," he said slowly. "Given the right environment. It depends a lot on the magnitude of the suggestion and the natural resistance of the subject. Some individuals require a little help—Sodium Pentothal or Ephkal-A."

"Ephkal-A—that was developed here, wasn't it?"

"Yes."

"You've worked with it, then."

"Yes, I have. It's been very helpful in handling the endorphine imbalances that contribute to nasty conditions like schizophrenia."

"In other words, it helps you adjust someone's attitude."

Vance shook his head. "Not quite. It helps the body adjust its own attitude. There's a difference."

"OK, distinction noted. But it makes this hypnosis thing doable?"

"Oh, it's doable. But it's also undoable. The effects have been known to fade."

"Fade? Over how long a period?"

"Years, months. But real memories tend to do the same thing. Even things I did—oh, last night, say—tend to take on an aura of . . . fantasy." He gave her a provocative look.

"I love you too," she said. "But couldn't this fading be counteracted with a regular regimen of Ephkal-A?"

He sighed. "We put schizophrenics

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on Ephkal-A boosters. It keeps their moods balanced and helps them to retain positive memory associations. It can be taken orally. . . . Where's all this leading, Mags?"

"I'll tell you. But I want you to be quiet until I've finished. Take notes if you have to. Then I want to hear what you think. *Then* I want to know if you'll help."

She was back in O.R. an hour and a half later, her face flushed and a mad gleam in her dark eyes. She called her team away from their calibration routines into a powwow.

"OK, here's the new Phase Five game plan. The object of the experiment is to send Toto back one day to another location here in the Emerald City. Specifically . . ." She tapped out something on her handcomp and handed the unit to Shiro. "These coordinates."

The younger woman glanced at them, then looked up puzzled. "These are right downstairs, aren't they?"

Oslovski nodded. "They are indeed. Directly below us, as a matter of fact."

"That facility is identical to this one, isn't it?"

"Right again. I just notified Admin that we're going to be making use of it for some very delicate and oh-so-top-secret work. Peter was ecstatic. It's one more thing he can add to the DOD tab. Phase Five now goes something like this. We send Toto down and back to ascertain we can hit the precise coordinates. Then, we're going to incorporate a little bit of Phase Six into the plan. We're going to bring in our animal friends. First, the mice, then, if they survive, we'll send Q-Bert with a full medical array. And if *he* makes it through all right, it's onward and upward."

"You mean we're going to go to a human subject?" asked Trevor.

She nodded. "Except that for the first-round human Shift, we'll just send someone downstairs in the same temporal range, just to make sure they're OK."

"Teleportation?" George looked both eager and concerned. "What about Temporal Spectrum Shift? We've never tried moving an object along the same wave band. Theoretically, I'm not sure it would work. We can't put someone through solid walls."

"But we can use the Temporal Spectrum to move them from one place to another," said Shiro. "We can shift back, change the location on the Spectrum, then shift forward again."

"Ah!" George nodded. "Ah, yes! Sort of like a knight in chess."

Shiro looked doubtful. "I guess so."

"And to what purpose do we do this?" asked Trevor.

The devil was back in Oslovski's eyes. "To the purpose of making the irresistible force perceive an immovable object. Think, Trev. What might make our clients adjust their attitude?"

"Is this a quiz?"

"Think."

"OK. Well, you said it. An immovable object."

"Yes!" Shiro nodded eagerly. "I see. Something they can't change. A—a *future* they can't change, perhaps."

"That's what I hope to show them, people," said Oslovski. "A future that their monkeying around didn't change to their liking."

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"And what about the other thing?" asked Trevor. "What are we going to do about that?"

"We're gong to stop them. Stations, people. Let's complete our calibrations."

Q-Bert weathered his flight with all the aplomb of a veteran time traveler. He complained only when his sensors were attached via a small cap that fitted tightly over his head and fastened under his jaw. Louis had added insult to injury by laughing at him, something the genteel terrier couldn't abide.

"You're the first person he's bitten since he was a puppy," said Trevor, as they reviewed Q-Bert's data.

Louis stared glumly at the bandage on his finger. "Should I take that as a compliment?"

"I think you should take that as a warning not to laugh at Q-Bert. He's a scientist, after all, just like the rest of us. Except, of course, that he has a wet nose."

"Yeah, and sharp teeth." Louis shook his finger. "How did he do?"

"Just great. Respiration fine. Brain activity, relaxed—except when he bit you. Heart rate, normal. Blood panels look good. He's a healthy, happy canine."

Louis bit his lip and tried not to look desperately excited. "That means the next step is sending one of us."

Trevor nodded. "Once Magda's seen this data, I think she'll agree to that." He gave Louis a sideways look. "Are you volunteering?"

"You bet, Kimosabe. Wild horses couldn't stop me. I can just see the headlines: Descendant of Sitting Bull First Man to Time Travel." He grinned. "My folks will be so proud."

Trevor looked skeptical. "Are you really a descendant of Chief Sitting Bull?"

"Bona fide, guaranteed." He twiddled the eagle feather that hung, solitary, from the braid at the back of his head.

"That's ironic."

Louis raised his eyebrows.

"Little Big Horn," said Trevor. "The Sequel."

Operation Little Big Horn proceeded the next morning with a careful, full-staff study of Q-Bert's data. Q-Bert himself was subjected to a thorough examination by Drs. Trevor Haley and Judy Walsh. When that was over, Magda Oslovski OK'd the next phase.

Louis took Q-Bert's place on the Spectral Grid, watching nervously as Trevor set up his sensors for the trip. Downstairs in the other O.R., Vahid Khadivian waited for the materialization.

Psychologically, Louis didn't take the Shift as well as Q-Bert had. His heart raced as the Field was activated and he was unable to slow it down. The Field danced like a swirling patina of stars before his eyes. A tingling sensation cascaded down his back, then spiraled upward again to spin crazily, but not unpleasantly, in his head. He blinked rapidly several times—saw colors flash vividly.

'My God,' he thought, 'it really *is* a spectrum.'

Then the trembling stars returned and melted and he was watching Vahid Khadivian blink back at him. They stared

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at each other for a moment, then Vahid grinned and said, "Welcome to the Underworld, my son."

Louis let out a whoop.

"Your heart rate got a little crazy there, Louis," said Oslovski. "All through the Shift."

"I just got a little excited, that's all. Really." He shrugged. "Adrenaline is a powerful drug, doctor."

"No discomfort?"

"No. No, it was . . . tingly. Exhilarating. And there really are visible color bands. I saw them flashing when the Field effect faded."

"Mmm." Oslovski looked at the computer display again. "And most important of all, you made it. You ended up right where you were supposed to." She gazed off into space for a moment. "OK. All right. Next phase."

In the week that followed, they sent Toto back to the target date. He recorded the entire assassination attempt, tucked neatly away behind a pillar on the upper deck of the Conference Center. Oslovski's team reviewed the footage painstakingly. They studied official accounts. They met far into the night, discussing, consulting, arguing, mentally rehearsing routines for Phase One of Operation Little Big Horn; running over a long list of "what-ifs." They also started laying the groundwork for Phase Two.

When the big Monday arrived, the Chiefs appeared in full military regalia. With them were two "special operatives"—Ferris and Hilyard by name. Oslovski adopted the immediate suspicion that these were the would-be assassins. They contributed nothing to the briefing, but merely sat in silence, watching and listening.

Magda Oslovski conducted the briefing flanked by Vance Keller and Trevor Haley. The other members of the LBH conspiracy were busily readying themselves for the inevitable demonstration.

"Since I talked to you last, General Caldwell," said Oslovski, "we've had several important breakthroughs. But rather than tell you, we'll show you. Dr. Haley, the video please."

Around the oval table, video displays showed footage taken by Toto during his visit in New York. The aborted assassination played out, followed by mass confusion, an explosion of golden motes and a sudden shift to aqua. The screens went black.

Oslovski's eyes were still on Caldwell as he turned to stare at her.

"That . . . that was the assassination attempt on—"

"Yes. The date you gave me was the opening day of the First World Congress. But, of course, you knew that. We just happened to get this rather spectacular footage of the attempt on President Gorbachev's life. That was the event you were targeting, was it not?"

Caldwell glanced at his clam-faced peers and nodded once. The corner of his mouth twitched.

"Forgive my curiosity, General," said Oslovski, "but what do you intend to accomplish?"

"The righting of a wrong, Doctor," he said. "That's all you need to know. And that our work, our very lives, are dedicated to the best interests and the honor of this great nation."

"And the well-being of its people?"

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He smiled. "Of course, Doctor. The two things are inseparable."

"And what about the welfare of the world as a whole society?"

"The world is not a whole society, doctor. It's a mish-mosh of societies and cultures. My concern—*our* concern is with the strength of the American nation. The other nations only concern us insofar as they are either beneficial or dangerous to the United States's best interests."

"I see." Oslovski nodded. "And may I guess what you hope to accomplish?"

"You may guess all you want. We will neither confirm nor deny."

She nodded again. "Naturally. . . . Two possibilities present themselves. One is that you wish to make sure the assassin isn't, himself, assassinated so you can find out who hired him."

General Caldwell's smile didn't falter. "A reasonable assumption, I suppose," he said.

"The other possibility is that you intend to make certain he succeeds."

None of the faces at the nether end of the table altered expression, but there was an eloquent flurry of exchanged glances.

Caldwell merely quirked an eyebrow. "What an interesting mind you have, Dr. Oslovski. I'm glad you're not working for the other side."

Oslovski smiled as if accepting that as a compliment. "What other side, General?"

"You do realize, of course," Caldwell said, ignoring the question, "that you are contractually and ethically bound to bring this project to a successful conclusion regardless of what we intend to do. So, you see, our intent is really irrelevant."

"Of course."

"And, of course, as scientists, you must observe a sort of code of nonintervention."

That was more order than commentary and Oslovski bristled. If one more person cited the "Scientific Code of Nonintervention" or preached objectivity at her, she vowed she'd send them back to the eruption of Krakatoa.

"So, we've seen that you can send a robot back to the target time and place. What else have you got for us?"

She showed them the bio-data on Q-Bert and Louis which included Louis's recorded account of his experience. She took them to O.R. next, explaining the function of each station.

"How soon?" asked Caldwell when they'd concluded the short tour and examined Toto and the Field Generator. "How soon can our operatives begin making time jumps?"

"We can make them part of a demonstration right now, if you'd like."

The Chiefs were more than eager to see a Temporal Shift in action. They watched as each operative was sent to places and times that were easily verifiable. Both men handled the experience as if they were veteran time travelers and consumed healthy amounts of lunch immediately after.

"They're *ice* men," said Shiro.

Oslovski's team was reconnoitering in the O.R. after their own hasty lunch, while their clients privately debriefed.

"You'd think they were just taking a drive around the block."

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"Conditioning," said Trevor. "Mental conditioning."

"Mm-hm. And we have to get around it somehow."

Oslovski blew steam from her coffee cup and grimaced. "This is where we try a little psychology. They've been wondering all morning why the team shrink's been included in. They're about to find out."

They rejoined the Joint Chiefs in the Level 3 conference room for a final meeting to discuss any questions generated during the day and to set a timetable for the next phase of the project.

Could delicate equipment go through the Spectrum, the Chiefs wanted to know. Could weapons?

Toto *was* delicate equipment, Trevor told them, the video rig and medical array, likewise. "For that matter," he added, "a human being is delicate equipment. As for weapons . . ." He wanted to claim some magical Omniscient Guardian of the Time Spectrum caused all weapons to disintegrate on transit, but couldn't. "There's no reason why they shouldn't be fine."

"I'm satisfied," said General Caldwell when the question-and-answer session had wound down into nodding and note taking.

Oslovski raised her eyebrows. "General, you're overlooking a very important factor in all of this."

"Oh? And what might that be, doctor?"

"I think Dr. Keller is more qualified than I am to speak on that subject. Doctor, would you answer the General's question?"

Vance nodded, tapping a pen lightly on the table top. "The psychological ramifications of time travel are quite complex."

"For example?"

"Well, General, you're undertaking to change history. Have you considered how many events might hinge on the one you propose to change?"

"It has been considered."

"Then you are all prepared to face the changes in your personal lives that may result from your . . . " He'd been going to say "meddling," but smiled and finished, "editing of history?"

"We're counting on it," said Caldwell, and the others nodded.

Dr. Keller spread his hands, palms up, on the table. "I just wanted to be sure you were properly prepared. It could be quite a shock for your operatives to return and discover they've edited a loved one out of existence."

"What?"

They were all staring at him as if he'd just said "There's a bomb under this table." Oslovski fought the urge to grin.

"Gentlemen," she said, "you must be prepared for any eventuality. You *yourselves* could be 'edited' out of existence by a change in history."

"My God, how can anyone be prepared for that?" The reserved, soft-spoken Naval Admiral Krenshaw was visibly stunned.

Vance Keller nodded sympathetically. "I know it's a terrifying prospect—to suddenly find your entire life rewritten—wives married to someone else, children never born. And, of course, the guilt factor could be immense—the realization that you did it to yourselves."

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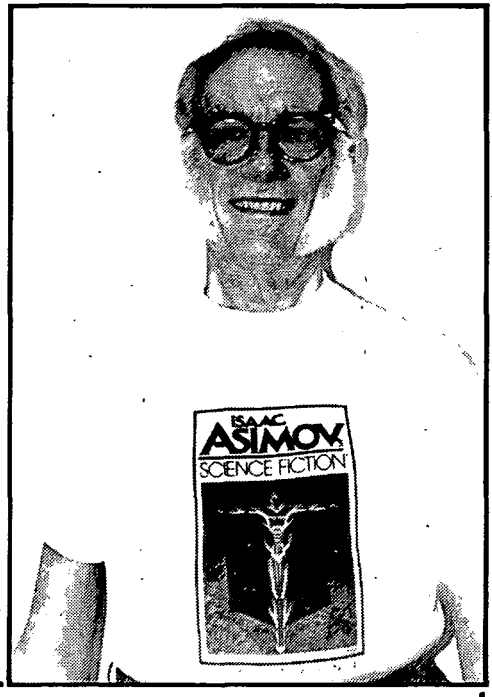

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Caldwell looked like he'd just swallowed a sour pill.

"And then," added Oslovski, "there is the possibility that your operatives could be stranded in the past."

"I thought you said that the technology was reliable," said Caldwell sharply.

"Oh, it is. But it's entirely possible that with a change in history, the technology might never be developed."

"That's damn pretzel logic! If the technology is never developed then how could anyone go back in time to—to get trapped?"

"The technology is reliable," said Oslovski. "But the concepts behind it are sometimes dimly understood."

Caldwell's jaw was ticking. "And how do you propose we prepare for these eventualities?"

Oslovski met his chilly gaze with an equal amount of frost. "That's what we have a psychologist on staff for, General. I would recommend that your operatives spend some time with him during their orientation."

"Orientation?"

"We'll need to do a complete medical work-up on anyone who's going to be sent that far back through the Spectrum and stay for any length of time," said Trevor. "We have to know the normal physiology so any abnormalities can be spotted."

Caldwell nodded, once. "When do you want them?"

"Right now. Barring unforeseen difficulties," said Oslovski, "we can be ready to send one of your men back to the target in a week, maybe two."

Caldwell frowned, puckering his mouth. "You're sure the field can't be expanded to take both men through at once?"

"That could lead to a dangerous instability in the Field. We might attempt to send two subjects through in single file, as it were. But until we've successfully retrieved two non-human subjects, we can't try a double passage with your men."

Caldwell looked like he wanted to say something else, but didn't. He took his Joint Chiefs and departed for Washington D.C., leaving Ferris and Hilyard in the capable hands of Oslovski and Keller.

Vance began "preventative therapy" sessions with his two subjects almost immediately. They discussed the ramifications of editing history in great detail. He encouraged them to talk about their fears. Then he worked hard at exploiting them—something that rubbed completely against his grain.

"Dammit, Mags, I can't help but feel like a traitor to my calling. I'm supposed to help people *overcome* their fears and anxieties, not feed them." Vance ran a hand roughly through his curly, black hair and grimaced.

"Sometimes fear is healthy, Vance. You know that. It keeps us from doing stupid, dangerous things like screw with history. People *should* be afraid to do that shouldn't they? Shouldn't they be afraid or ashamed to commit murder?"

He looked up at her out of the corner of his eye. "OK, when you put it like that, it sounds almost noble. I guess I just needed to be sure that it really *is*. That we're not just rationalizing. Because using psychology that way rubs me raw."

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Magda folded her arms across her chest and studied his face. "Is it that bad? Do you want to opt out?"

He threw up his hands in exasperation. "No, it's *not* that bad, dammit, but this little voice in my head keeps telling me it *should* be. Frankly, knowing what I know, it's hard to be objective. Hell, it's *impossible* to be objective. Hilyard gives me the creeps and Ferris has the most advanced case of tunnel vision I've ever seen when it comes to the activities of the military. To hear him talk, you'd think the Joint Chiefs should be canonized—or at least knighted. And Hilyard—" He shook his head. "I got him talking about war and how he felt about it. He said he thought dropping the bomb on Hiroshima was beneficial."

Magda shrugged. "A lot of people feel we wouldn't have achieved peace without having stood face to face with that horror first. You have to admit, it made the whole world stop in its tracks and realize war was a no-op."

"I think he meant it was beneficial because it let the other nations know who was boss. It established the U.S. as a Super Power—'separated the men from the boys,' as he put it."

"Oh . . . so, how are they doing with the program?"

Vance's dark face brightened a little. "Pretty well, actually. Hilyard is just oozing with half-healed postadolescent wounds and a lot of resentment against his superiors. He doesn't like feeling expendable and he fears that's just what he is. Ferris is just a conscientious G.I. trying to do what he feels is his patriotic duty."

"Assassination?"

Vance shrugged. "I've had them both under hypnosis. Ferris seems to take the post-hypnotic suggestion just fine, but Hilyard's a little resistant. Oh, there's one thing I might be able to use against him, though." He made a face. "Dear God, did I just say that?"

Magda threw a paper clip at him. "Snap out of it, Doc."

"Anyway, he expressed belief in reincarnation and past life regression. I think there are some possibilities in that direction."

Magda nodded, looking thoughtful. "Vance, what's your assessment of the mental and emotional health of these two men?"

"That's a tough one. Judging from what they're planning to do. . . ." He shook his head. "I'd have to say we were looking at two pretty sick little puppies. Oh, mentally, I'd have to give them a clean bill of health—based solely on the standard issue tests. But faced with this . . . mission of theirs, they've got to be buying their day-to-day sanity at the expense of their emotional stability."

Magda got up and moved to face him, locking her fingers at the back of his neck. "While you're busy feeling guilty about brainwashing them so they don't have to go through with their mission, ask yourself what would happen to them, mentally and emotionally, if they *did* go through with it. Hilyard is right, Vance. As far as Caldwell is concerned, they *are* expendable."

During the week and a half prior to their Time Shift, Hilyard and Ferris each established their own unique behavior patterns. Colonel Ferris spent most of

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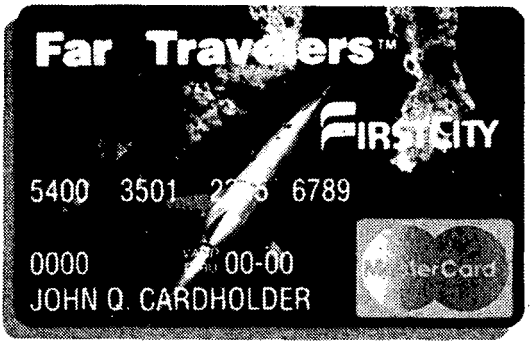

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his free time alone or, almost perversely, it seemed, in Vance Keller's company. He rarely interacted with any of the other team members.

Hilyard, on the other hand, elected to shadow different members of Oslovski's team, insatiably asking questions about the Temporal Spectrum and its attendant technology.

"It's almost as if he doesn't believe it," said Trevor, "and he's asking all these questions trying to catch us out."

Shiro nodded. "I know just what you mean. And you know, he actually seems to understand what we tell him. It's eerie. I feel like he's watching us all the time. Listening to everything we say and taking notes."

"He *is* taking notes," averred Louis. "Every time I turn around, he's talking to that handcomp. I'd *love* to get my hands on that thing to hear what he's been saying about us behind our backs."

"Let's get serious, folks," said Oslovski from the head of the table. "He's very likely keeping reports for Caldwell. Let's just make sure he doesn't see or hear anything compromising. Now, tomorrow's the big day. We'll have one more procedural drill tonight. Are there any issues we need to discuss? Judy?"

"I'm a little concerned about the combined effects of Ephkal-A and the tranq they'll receive. The tranquilizer will inevitably create a condition that the Ephkal-A will counteract. I'm wondering if we shouldn't delay the infusion of Ephkal-A until after the Shift. That way they won't be subjected to an endorphine double-whammy."

Oslovski nodded. "A valid concern. Trev? What's your opinion?"

"I can see a potential for metabolic confusion. There'll be a natural tendency toward rapid pulse and increased adrenal activity. The tranq will damp that and it will depress some neural functions, which Ephkal-A will then try to elevate. But, frankly, that could be to our advantage."

Judy Walsh flushed angrily. "What about *their* advantage? Or don't we care if we drive them into a seizure?"

"Of course we care, Judy," said Trevor. "I just don't see a clear danger. Q-Bert didn't have any problem with the compounds."

"Q-Bert's a dog, not a man. His heart didn't pound the way theirs did. His nervous system didn't go into overdrive. They may seem like icemen, but they're not. I'm afraid of what the combination of drugs and adrenalin might do."

"I think Judy has a valid concern," said Oslovski. "Vance, is there any way they can receive the Ephkal-A at your end?"

"I don't see why not. We'll have to get the timing right—wait until their attention is engaged elsewhere—but sure."

"All right. Trev, will you oversee that?"

He nodded, making a note on his handcomp. "Got it."

Oslovski glanced around the table again. "More issues?"

Vance raised a hand. "I've got a couple. Which do you want first, the good issue or the bad issue?"

"Oh, please. Let's hear the good one first."

"Well, as you no doubt noticed, Bert Ferris has been stuck to me all week. He's a nice guy, but sort of a bundle of

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contradictions. He's a very . . . religious man, I guess you'd say. Very active in his church. The doctrines of his particular sect include the idea that world peace is something that won't or can't or *shouldn't* come until the literal and physical return of Christ. The current peace is, *ipso facto,* false and evil. He more or less told me that he considers it his Christian duty to 'undo the Devil's work,' as he put it, in any way he could."

There was a moment of complete silence at the table. Judy Walsh's face was a deep red and Vahid's lips moved in a silent invocation.

"The good news is that this predisposition to—um—"

"Crusader mentality?" offered Trevor acerbically.

"Trevor, please," Oslovski cautioned him.

"Sorry. I just don't understand that mind set. If God hadn't wanted peace on Earth, how the hell could we have achieved it? Look at all the obstacles that had to be overcome. If the history of the last thirty-five years wasn't some sort of divine miracle—"

Oslovski raised a hand to stop him. "No one here is arguing with you, Trev. But our understanding of Ferris's mind set isn't germane. What *is* germane is that that mind set might be an advantage to *our* crusade."

Trevor mumbled something under his breath.

"As I was saying," Vance continued, "Colonel Ferris has a predisposition, even a deep-seated drive, to correct what he sees as a cosmic evil. He's a man with a mission—to see this false peace brought to an end. Now, I grant you that on some level, he is very likely aware of the contradictions in that ideology. And on another level, there's every indication that because of that ideology, these many years of peace we've enjoyed pose an extreme test to his faith. The bottom line (if I may be so crass) is that he'll *want* to believe he's accomplished that mission. He's already proved to take post-hypnotic suggestion very readily."

"Good," said Oslovski. "So, what's the bad issue?"

"The bad issue is that both of these guys are thoroughly terrified by the idea that they might 'erase' someone as a by-product of their mission. I think Ferris's sectarian indoctrination will override that fear, but I'm not so sure about Hilyard. He's a cold-blooded S.O.B., but he's got a mom, a dad, two younger brothers and a younger sister in Omaha, Nebraska. Even if he doesn't erase them, in any nuclear engagement that would be one of the first places to go—it's within spittin' distance of SAC Headquarters. He has what I'd call a very strong subconscious imperative *not* to believe that his mission was a success."

Oslovski's brow knit. "Has he been resistant to hypnosis?"

"More so than Ferris. It's not insurmountable. I just wanted to warn you."

"Consider us warned. Anyone else?" When no one answered, Oslovski started to dismiss the meeting. "In that case, we'll—"

"Excuse me." Judy Walsh's voice was barely audible.

Oslovski motioned for her to speak.

"I just . . . I just wanted you all to know we're not all like that. Christians,

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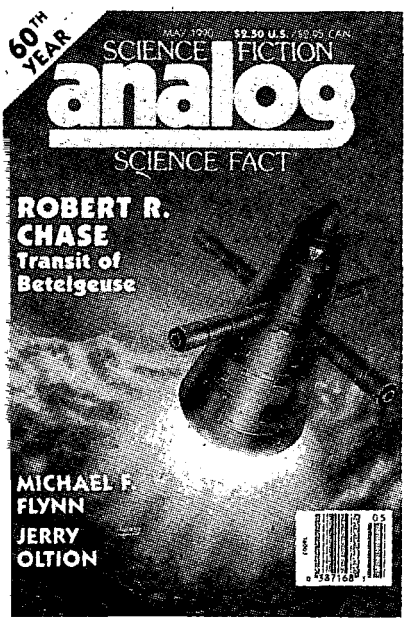

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I mean. Some of us—maybe even most of us—believe peace is God's will."

"And I must be honest in admitting," said Vahid, "that there are some very devout Muslims who feel much as Colonel Ferris does. I trust their beliefs will not reflect on me." He glanced at Trevor who shook his head.

"Of course not. I'm sorry if I was out of line. I hate bigotry. Especially my own."

At 0900 hours they were calibrated and ready. On strict orders from Caldwell, Ferris would be the first to go, Hilyard following as immediately as possible.

Magda Oslovski found that significant. It implied that Ferris was the primary operative and that Hilyard was his backup. She, Trevor, and Vance briefed them just prior to the Shift, reminding them not to stray too far from the Temporal Field Grid lest they lose track of it and become stranded.

"Of course, one of you could heft it and carry it with you," said Oslovski. "It's portable enough, but the potential for damaging it is increased if you move it. The nearer to the materialization point you can accomplish your . . . mission, the better. We've positioned you behind a support column, well out of sight so you should be able to just leave the Grid in place." She glanced at her handcomp, checking her notes. "Oh, yes. You'll be invisible as long as you're within about two meters of the Grid. That's part of the Field effect. Again, if you stay close to the Grid, you can use that for cover."

Trevor Haley bit the inside of his lip and peered studiously at his own handcomp.

"If there are any questions?" Oslovski glanced from one operative to the other. Both shook their heads. "All right, then. Colonel Ferris, if you'll follow Dr. Haley, he'll set you up on the Grid. Major Hilyard, you'll watch from the observation deck with General Caldwell."

Judy Walsh was nervous. Her hands shook slightly as she prepared an infusion of tranquilizer for Colonel Ferris. She breathed a sigh of relief that he wasn't the type that liked to watch shots being administered.

She was just preparing to infuse him when he sighed and said, "I don't suppose you could give me a *pill* to adjust my electrolytes?"

She blinked. There was a smile on his lips and it unnerved her. She glanced at George Wu, who was performing the last minute adjustments on Ferris's biomonitor.

"Sorry, Colonel," said George, "but we've got to get this stuff into your blood stream pronto. Besides, Dr. Walsh likes to watch people squirm." He grinned conspiratorially. "We have to let our M.D.s have *some* fun or they get cranky."

Judy smiled nervously and pressed the infuser against Ferris's neck. He winced, then sighed again and looked at her.

"Pretty women are so often cruel. I've never understood that."

"Yeah," said George, his eyes on Judy's blanched face. "Uh, Dr. Walsh, we'd better hurry." He jerked his head toward the O.R. She nodded, picked up

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her tray and let him steer her out of the Theater.

Once in the O.R., she set the tray down with a clatter and wrapped her arms around herself.

"Thanks, George," she mumbled, her teeth chattering. "I'm sorry, but this whole thing is just—"

"Shifting," said Shiro.

Judy glanced at her, then at the monitors. The Spectral Field glistened like a shower of diamonds. Within it, Colonel Ferris faded from sight.

"Station, Dr. Walsh!" ordered Oslovski.

Judy exhaled sharply and slid into her seat. The data on the colonel's vital signs rippled across her screen. "Heart rate spiked briefly to 150. It's falling off now. . . . 120 . . . 100. Stabilizing at . . . 95. Respiration seems normal."

Oslovski leaned toward Shiro Tsubaki. "Where is he? Or should I say, when is he?"

"Green minus seven and Shifting towards Aqua."

"On the timer, Shiro. Give the tranq a few more seconds to work, then make the spatial shift and pull him in."

Shiro nodded and glanced at her timer. "OK, I'm going to reset coordinates in 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0. Resetting coordinates." She punched up the new location on her keyboard. "Cue Trevor. Reversing Field . . . now."

Oslovski activated her headset and hailed Trevor, who was standing by in the lower level Theater. "Shiro's reversing now. You'll have him in about twenty seconds."

"We're ready." Trevor hefted the infuser-full of Ephkal-A and waited, his eyes on the spot where Ferris and the Temporal Field Grid were slated to appear. Beside him, Vance Keller took a deep breath and counted.

Ferris rematerialized right on schedule, head lolling slightly, hands still clutching his compact weapon. He materialized face into a curving screen that all but engulfed him. His unfocused eyes saw the sweeping upper gallery of the World Conference Center. He wobbled his head to the right. A pillar blocked his view.

Trevor moved quickly with his infuser, then nodded to Vance. "He's all yours," he mouthed.

Ferris was troubled. The Time Shift had disoriented him and he felt slow and muzzy. He was glad the chosen location offered so much protection. He knew he was supposedly invisible, but he found that a little hard to believe. He chucked inwardly at his own skepticism. Here he'd just traveled through time and he was balking at the idea of invisibility.

He scanned the immediate area. It was completely clear. According to their information, this part of the auditorium had been totally sealed off and was guarded at either end. There was no way in and no way out . . . except *their* way.

He could hear the sound of myriad voices rising from below and checked his watch. It was 10:45. He settled his shoulder against the pillar and waited for Hilyard, the "Battle Hymn of the Republic" playing softly in his head.

Dr. Judy Walsh was ready this time, or so she thought. She had a smile all

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ready for Major Hilyard as she prepared his infusion of tranquilizer. Then, he turned out to be a watcher. She gritted her teeth and smiled more broadly.

"What's in that shot?" he asked unexpectedly.

The infuser wavered an inch from his neck. Judy's face paled then flamed. "Just . . . uh . . . vitamins and . . . uh . . . a compound to—to balance your electrolytes."

"Why is that necessary?"

She tried hard not to meet his eyes, but hers kept colliding with them. "The effects of the Field cause certain . . . uh . . . stresses on the—on the nervous system. This will counteract them."

He studied her intently for a moment, eyes narrowed, then asked, "Is there anything harmful in it?"

She stared at him, half relieved, half terrified. "Oh, *no!*"

He nodded. "Get on with it, then."

Judy blinked at George—who stared back, owl-eyed—then administered the tranquilizer.

Bert Ferris swiveled as Hilyard materialized behind him. He checked his watch. It was 10:50. They checked their weapons—matte black rifles with scopes that were as long as the barrels—then moved stealthily to the steel and cement railing at the edge of the gallery.

Ferris looked back toward the Grid. He couldn't see it because of the pillar, but he guaged they were within the two meter invisibility range. He raised himself up slowly and peered over the edge of the gallery. He checked his watch again—less than a minute to go. He readied the rifle.

Below, Gorbachev was introduced in several languages. The audience cheered and applauded at length. Ferris's lip curled—a standing ovation for the devil. He rose to his knees and lifted the rifle. He sighted.

A shot reverberated through the hall and the figure in the center of the stage froze. In that second, Ferris fired twice. The figure crumpled beneath a spray of scarlet.

In the pandemonium after, Ferris sank back and gave Hilyard the thumbs up, then he crawled back to the Grid. After a swift peek over the railing, Hilyard followed. Ferris mounted first and waited for the Field to engage. A mere twenty seconds later, he was back in his own time.

Hilyard followed, coming out of the Field to see Ferris wobbling away toward the door. His own legs felt weak and he staggered against someone. He turned his head muzzily to see Dr. Walsh blinking at him. She tried to smile.

"You made it," she said. "Welcome back." She gave him another infusion. "Something for the disorientation."

He nodded and let her lead him from the room.

"I don't understand it," fumed General Caldwell, "You said expect changes. And believe you me, we did. But nothing's changed—not a *damn* thing. Killing—fulfilling our mission seems to have accomplished nothing. I called our contacts in Washington, Berlin, Moscow—everything is the same."

At the mention of his contacts, Magda

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Oslovski glanced across the table at her husband, her heart suddenly feeling like an ice cube in soda water. Did the contacts check their history books? If they did—She berated herself mentally for such a glaring oversight. They'd been so wrapped up in the technological aspects of the situation, they'd ignored the most obvious logical ones.

"General," said Vance, "we never said things *would* change radically. Just that they *could*."

Out of the corner of her eye, Oslovski saw George Wu trying to attract her attention. He gestured, first, at his video unit, then at himself. She responded with a slight nod.

"Are you *sure* you killed him?" Caldwell was asking Ferris.

"Killed or vegetized," responded the colonel emphatically. "No one survives two direct hits to the head with an AK-70."

"Hilyard, you corroborate?"

Hilyard nodded.

"How can we know for certain?" was Caldwell's next question.

Oslovski glanced at George Wu.

"History books," he said quickly. "Newspapers. We can have the Library Computer get a sampling."

"Do it."

George keyed in his request. Within seconds, they were looking at a front page spread: GORBACHEV VICTIM OF ASSASSINATION PLOT.

"Continue," George prompted. The page changed. WORLD STUNNED BY VICIOUS ATTACK ON GORBACHEV: DOCTORS HAVE LITTLE HOPE FOR SOVIET LEADER'S SURVIVAL.

"Hold that!" said Caldwell. "Let me read the copy."

"Amplify," said George.

The page enlarged, rendering the text beneath the caption readable.

"He wasn't killed," murmured Caldwell. Then frowned. "But it amounts to the same thing—severe brain damage, kept on life support in a Moscow hospital. He's a vegetable." He shook his head. "I don't get it. How come nothing's changed?"

"What were you expecting?" asked Oslovski as dispassionately as she could.

He ignored her, his eyes devouring the story on the monitor.

"I could find some history books," offered George.

Caldwell waved a hand at him. "No, don't bother. I caught the drift from this—" He flicked his fingers at the newspaper spread. "A lot of wimpy speeches about 'our brother's sacrifice not being in vain,' a lot of fancy political rationalization about the impossibility of going back. Weak willed—" He clenched his jaw.

"Maybe the effects are further in the future," suggested Ferris.

"That's a distinct possibility," said Oslovski thoughtfully. "Time travel is a frontier. What we know of the Temporal Spectrum suggests that changing history—altering the pattern of the Spectrum—might cause an actual branching effect. This close to the bifurcation, we might not see its full effects. Although, heaven knows, we could even have created an anomaly—a parallel history, or a bubble in history."

"And we could be in the middle of this . . . bubble?" asked Caldwell.

Oslovski adjusted her glasses on her

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nose. "As I said—a distinct possibility. Then again, maybe Someone or Something just won't let us change history . . . retroactively."

Caldwell just stared at her blankly. Ferris gritted his teeth. Hilyard smiled.

"How far in the future—these effects?" demanded Caldwell.

Oslovski shrugged, enjoying his frustration. "Years, decades . . ."

"I want to see it," he said. "I want to see the future."

"All right, but it will take several days to recalibrate our equipment for a forward Shift. We could be ready to send your operatives into the future in as little as . . . say . . . four days."

"Not them, me! I want to see it! Hilyard, you'll come with me. In the mean time, I'll be having my contacts check their own library computers." He jabbed the table with his forefinger, then pivoted on his heel and left the room with Ferris right behind. Hilyard watched them leave, then rose slowly and followed, still smiling.

Oslovski shivered. "I see what you mean about him," she told Vance. "He *is* creepy." She turned to George. "I could just kiss you! Where did you get that stuff you showed us?"

George shrugged. "Over the last couple of days I got to thinking about how Caldwell and his bunch would react to this, and it occurred to me that they'd want to see solid proof that what their operatives said happened actually *did* happen. There wasn't any time to discuss it with everyone, so I had the Library Computer play 'what-if' with the assassination and come up with some hypothetical headlines and political analyses. Then I just got a little creative with the output and had the computer assign well-known authors to the commentary. There's a front page, lead story and follow-ups for every major U.S. and European publication. Oh, and I had the computer draft some hypothetical history texts, too."

"What made you decide Gorbachev didn't die?" asked Vance.

"Well it also occurred to me that Caldwell might very likely do his verification somewhere that fell through my cracks, as it were. If he did, he'd see that Gorbachev died of natural causes in a private hospital outside Moscow about eight years ago. I had to adjust my 'history' to that. I was able to get to his private computer through the Library of Congress system. If he connects through that system, he'll find that Gorbachev was taken to a private facility where he eventually died—this is history according to George, now. I also planted the idea that there was an attempted cover-up. That a group of Soviet higher-ups tried to make light of the President's injuries and claimed that he had only been superficially wounded—so that people wouldn't lapse into despair or renewed animosity."

"Why that?" asked Vance.

"Covering our tracks, Doc. There's still every chance that Caldwell or his contacts could look in the wrong places and come up with a Gorbachev who was not only alive, but lively. Even with my noodling, that could still unravel our whole fabric. Now, if I knew who Caldwell's contacts were, what data bank they'd be likely to access and what nodes they'd be using, I could make sure they all got matching information. Unfortunately, I'm not a mind reader."

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"You might not have to be," said Oslovski. She held up a small, dark grey box. "Hilyard dropped his handcomp."

George ogled. "And it's displaying a list of contacts?"

"No, it's displaying an index." She held it out to him. "You're the hacker—have at it."

It was at once logical and beyond all possible miracles to suppose that the names and system addresses of Caldwell's contacts for Project Hourglass were amongst the data stored in Hilyard's handcomp, but they were. George and Louis went into high gear. They downloaded the information into their own handcomps and immediately set about using it to shunt any requests for information originating from the contact's terminals through to the QuestLabs's Library. Hilyard's unit was returned to him posthaste.

"But what if somebody just goes to a library terminal and requests information about Gorbachev's assassination?" asked Shiro.

George allowed himself a self-congratulatory grin. "I planted something in the nature of a glorified IF-THEN statement in the Library of Congress system. IF anyone requests information on the assassination attempt, THEN they get routed to our ersatz fact file. Since all libraries network to that system—" He shrugged.

"George, you're a marvel," Oslovski told him.

He blushed faintly at the praise. "Well, I couldn't cover *all* our tracks, but I did what I could. It's just . . ." He made a wry face.

"What?"

"Well, it seems too much of a fluke, I guess. Here we find ourselves in a position where we could use certain information and—bingo!—it falls onto our conference room floor."

"Miracles do happen," observed Vance.

George tilted his head. "I don't doubt it. But there's something a little odd about this miracle. For two weeks, Hilyard's been taking notes on that handcomp. I didn't find a trace of them."

"Maybe it was encrypted," suggested Shiro.

"Even encrypted information takes up room in memory, my dear. The only data left in that unit, with the exception of the information we needed, was general stuff. There wasn't even a letter to mom."

Oslovski stiffened. "You're suggesting we've been set up."

George shrugged. "The nodes I accessed were operative and the addresses and passwords were real. Maybe I'm just being paranoid."

"And maybe not." Oslovski frowned thoughtfully. "Let's keep a close eye on Major Hilyard."

"What do we do if he does anything suspicious?" asked Louis.

Oslovski grimaced. "I haven't the foggiest idea. But we don't have any time to worry about it. We've got to get ready for Phase Two of Operation Little Big Horn. First order of business is helping General Caldwell decide where to go."

"It has to be some place where I can ascertain military activity," said Caldwell. "In other words, a military installation."

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"A . . . War Room, perhaps?" suggested Oslovski.

"You mean a Tactical Center," corrected Ferris. "We haven't called them War Rooms for years."

A rose by any other name, thought Oslovski. Aloud, she said, "Tactical Center, then. Would that be appropriate?"

Hilyard looked up from fiddling with his handcomp. "Begging your pardon, sir, but if a Tactical Center was in operation in the future, wouldn't that indicate something about the health of the military establishment?"

Caldwell nodded slowly. "Makes sense. All right. Send us to Offutt. If there's any activity at all, it'll be there."

Four days later they were ready for the Shift, their target, the year 2075, Offutt Air Force Base, Bellevue, Nebraska. Caldwell didn't ask what was in his shot, but accepted the electrolyte story at face value. This time it was closer to the truth. Instead of a powerful tranquilizer, the infusions contained only a mild neural damper and a dose of Ephkal-A.

Hilyard went onto the Grid first—a precautionary measure, Caldwell insisted. Caldwell himself was nervous as he followed; only Hilyard's extreme calm persuaded him he was not going to merely evaporate into the shimmering void.

He rematerialized in semi-darkness and stiffened in apprehension. The wave of anxiety passed at the pressure of Hilyard's fingers on his arm.

They were standing on a narrow catwalk. What light there was in the vaulted room seemed to be coming from below. Figures moving about the room cast eerie, elongated shadows onto the curving ceiling. Caldwell and Hilyard moved in unison to the steel railing at the edge of the carpeted walk; Caldwell looking back to make certain the move left them inside the invisibility range.

Below and beneath was a large horseshoe-shaped chamber bathed in mellow gold light and populated by uniformed soldiers. Computer-generated maps alternated with video screens along the curving walls, while in the heart of the room were several computer stations. Directly at center was an odd piece of equipment that looked like a rectangular stalactite/stalagmite formation rendered in some sort of an anodized, black metal. Between the top and bottom of the unit, hung a shimmering curtain of colored light. Next to that mystery stood a figure with what appeared to be an admiral's ensignia on its shoulders.

Caldwell frowned. The uniform was an unfamiliar silvery-blue, unrecognizable as being from any branch of the military. The rank suggested Navy, but . . . He scanned the other figures. Several, apparently officers, also wore the silver-blue, others wore a vivid shade between royal blue and midnight. From his high vantage point, he saw nothing of their faces; only the tops of heads covered with unfamiliar caps.

Before he could solve the puzzle, one of the blue-suited soldiers seated at a computer terminal turned and said, "Commander, we're receiving new data on the northern front. It looks like a much bigger push than we anticipated."

"On screen, Tech Newman."

Caldwell stiffened. It was a woman's voice. He'd never objected to women

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entering the service—but in a War Room? Still, that the War Room was here at all was—One of the wall maps came suddenly to life—Caldwell stared.

Across a green representation of the United States and Canada, swept a coruscating swathe of gold, orange and red, its southern edge pressing as far south as Montana. On the east, it reached greedy fingers of glowing hues toward the Great Lakes.

"My God," Caldwell breathed awfully.

Hilyard glanced at him and tapped his ear.

The general barely noticed him. What nation could field such a massive front, let alone push it all the way into the northern states? He licked his lips, wondering what they were fighting it with.

"Have all the warnings gone out?" the admiral asked.

"Yes, sir. Forty-eight hours before the leading edge. Status reports are already coming in; everybody's battening down for the duration."

The admiral nodded. "When will the leading edge reach Yosemite?"

The technician plied his keyboard for an instant, then consulted his monitor. "Approximately twenty-four hours, sir. They've been advised."

Twenty-four hours? thought Caldwell. What army could move that fast? Maybe it was a weapon of some sort. Nuclear? No, too widespread. Chemical? Biological? How could they remain so calm in the face of such vast destruction—as if it was everyday fare. This looked like . . . Armageddon.

"Thank you, Newman," the admiral was saying. "Mr. Mendez?"

"Yes, sir." Another technician glanced up from her console.

"Are you in communication with Yosemite Base?"

"Yes, sir."

"What is their status?"

"Heavily embattled, sir," answered the slightly accented voice. "Commander Li says the situation is barely under control."

"Visual reference," ordered the admiral.

Next to the huge map, a video panel pulsed on. Nothing showed upon it but billowing smoke and flames. So faintly he wasn't certain he'd really seen them, Caldwell's eyes caught the movements of bodies plummeting through the fog-thick smoke. The observing camera eye panned. He saw uniformed soldiers scrambling through the blazing brush, flames patting at their passing legs like playful but deadly kittens.

Below, the admiral made a clicking noise and said, "Visual off. Advise Commander Li that we will send reinforcements immediately. Then contact Colonel Darnell and have her dispatch a company of men and aerial support units. I believe the closest air squadrons are aboard the UNS Crazy Horse. Have the air support sent in from there."

"Yes, *sir*."

"When you've completed that, put me in touch with General Dreyfus in Juneau."

The admiral turned as a second officer approached her carrying what appeared to be a handcomp. He made what Caldwell felt was a half-ass salute.

"So, Mr. Krasnik," said the admiral, not bothering to return the gesture.

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"What new hot spots do you have for me today?"

"Actually, sir, it looks very much as if we're going to have an unusual situation in Florida. Cuba Station has already begun tracking."

The admiral jerked a thumb at the odd machine to her right. "Show and tell, Mr. Krasnik," she said.

"I have General Dreyfus, Admiral," announced Technician Mendez.

The admiral signaled Krasnik to go ahead. "On audio."

"Admiral Halleck, sir. Good to hear from you," said a disembodied voice.

"I noticed you were out from under. What's your status, Vinnie?"

"Pretty bad. We've been hemmed in for the better part of four days. Everything was grounded. Today . . . it's terrible. The sheer number of corpses, sir—it's devastating. The bio-med team has been doing its best, but we—we've had to put so many of them down."

Caldwell's mind froze and threatened to recoil. What in the name of all things holy had they come to in the last fifty years—putting the injured down? His lips curled in disgust. He supposed they called it euthanasia or some such nonsense. Murder—that's what he called it. Sheer brutal laziness. He glanced again at the map. Or had the enemy weaponry become so hideous—

Beside Caldwell, Hilyard frowned thoughtfully, almost unconsciously resting his elbows on the catwalk's padded guardrail.

General Dreyfus finished his report, noting that he could use something larger than his present complement of destroyer, cruiser, and corvette to help "mop up."

"More men would be appreciated too, Admiral. We've got our hands more than full disposing of the bodies. It's gonna take one helluva pit to bury all of them."

Caldwell almost puked. He gripped the guardrail, oblivious to Hilyard's bemused observation. It *couldn't* be that bad. It could never be so bad that you had to—

Officer Krasnik turned from his machine and whispered something in Admiral Halleck's ear.

"My tactical officer informs me that you have about five days to get your situation in hand. You're evidently going to be hit fairly hard from the northwest again."

Drefus swore.

"Sorry, Vin. We'll get your reinforcements to you on the double. The battleship Wałęsa is in Anadyr. I'll have her deployed to your waters. How many men do you need?"

"I could use a battalion," said Dreyfus.

Halleck snorted. "Take two, they're small."

"I wasn't joking."

"I didn't think you were. . . . Casualties were that bad?"

"Thousands upon thousands, Admiral. Worst I've seen in a situation like this. The Apah Param couldn't have struck at a worse time of the year. Shit, it's hard to believe one damn boat could do so much damage!"

One boat! *One!* Caldwell swallowed and found his throat too dry for the activity. And what the hell was an Apah Param? He had the sudden horrible thought that perhaps the Enemy wasn't even human.

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"They will insist on year-round activity," said Halleck. "*We've* certainly advised them against their bad weather jaunts, but who can reason with them? It'd take another Gorbi, God bless him."

Caldwell's mouth popped open. *Gorbi?*

"Well, do your best, Vinnie," urged the admiral. "Of course, you always do. Then, when this is all over, why don't you take a nice vacation somewhere sunny and warm?"

"Oh, sure. So I can come back and do it all over again next year!"

"Well, you could transfer to Yosemite in the spring. We'll be sending in a couple of battalions to rebuild."

"Yeah," sighed Dreyfus. "I *like* trees."

Caldwell shook his head. The conversation was suddenly impossible to follow. His assumptions about the situation shifted beneath him like dune sand as he tried to make sense out of it.

Admiral Halleck signed off, then turned her attention to Krasnik and his machine. "Show and tell time, Mr. Krasnik," she said.

In response, the officer touched an instrument panel on one side of the machine's black base. The column of muted light became a colorful multi-leveled sea of three-dimensional images, flowing in stately waves—advancing, retreating.

They reminded Hilyard of the "plasma clouds" he used to generate as a kid, using fractal equations on the family computer.

Krasnik tapped and keyed and adjusted and the images settled into patterns that almost made sense. Vibrant green formed hills and vales below wisps and billows of subtly changing hues.

Hilyard frowned, bemused, then felt the patterns click into sudden clarity. His mouth twitched as he turned his eyes to the ogling Caldwell.

"And who have we here?" asked the Admiral, nodding at the 3-D display.

"This is Mariella." Krasnik indicated a violently eddying orange area high in one corner. "And this,"—he indicated the rolling greens—"is the coastal area we're afraid will be hardest hit when she rolls ashore."

Halleck shook her head. "Poor Cuba. That's twice in three years. What's the prognosis for Florida?"

"Not so good, if this continues to gain velocity. This mass here,"—he gestured with a sweeping, circular motion—"is strengthening rapidly. We may be looking at a full-fledged blow before tomorrow morning."

Caldwell's ogle changed to a stunned scowl.

"What're the chances of seeding her to force the precipitation?"

Krasnik shrugged. "Cuba's on it. Along with a wing of storm bombers from Mexico. We can but pray and send troops to help Florida batten down."

Admiral Halleck nodded. "Too bad we can't get Mariella to dump her load on Yosemite. Coax nature to put out her own fires. Wouldn't that be poetic justice?"

"We're working on it," said Krasnik soberly.

Caldwell's fists tightened on the catwalk rail. Confusion and anger swept up from his gut in a hot spray, warring

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with something blasphemously like relief.

"I've seen enough," he whispered and went to the Grid.

"What the hell was that place? Where the hell did they send us?" Caldwell turned on Hilyard the moment he stepped off the Grid. "It sure as hell wasn't a War Room!"

Hilyard blinked at him, feeling only slightly disoriented. "No sir, of course not. It was a Tactical Center."

"That was no Tactical Center like *I've* ever seen, Major."

"No sir. I don't imagine anyone else has ever seen one like it either."

"And that—and that *machine*—some sort of—of—"

"It was an atmospheric model, sir."

"A what?"

"An atmospheric model. A three dimensional projection of—"

"Yeah, yeah—Doctor!" Caldwell launched himself at Oslovski as she stepped into the room. "Where did you send me? What was that place?"

Oslovski glanced from Caldwell to Hilyard. "We sent you to a Tactical Center, just as you requested." She spread her hands in a gesture of bemusement. "I can't tell you more than that. You were there just now, I wasn't."

Caldwell swung back to Hilyard. "Major what do you make of it? What was that all about?"

"I'd say, sir," said Hilyard, his voice soft and almost patient, "that we were sent to a military Tactical Center. I'd also say that they seemed to be fighting battles on several fronts."

"Battles? What *battles?* They weren't fighting—"

"They were fighting all right, sir," said Hilyard imperturbably. "The enemy just wasn't . . . people."

"What did you see?" asked Oslovski.

"A farce!" erupted Caldwell.

Hilyard ignored him. "Evidently in the future, we'll be battling forest fires and hurricanes and oil spills . . . or so it seems." He shrugged. "Maybe reforestation will replace demolition as a specialty—an environmental defense specialty."

"That's absurd!" snarled Caldwell. "Fighting men *fight,* dammit. They don't damn garden!"

"And what's wrong with killing forest fires instead of people?" asked Oslovski. "Or planting trees instead of land mines? Wouldn't you rather be the heroes of a constructive process instead of the villains of a destructive one?"

"Villains?"

Oslovski looked him in the eye. "Most of us don't like war, General. We hate it. We're not likely to thank anyone who perpetuates it when peace is within reach. I know you don't understand that. Nor will you likely understand that most of us look forward to a day when the military is obsolete. Well, it looks like that day isn't going to come. It looks like the future needs the military, after all—needs it for construction instead of destruction. I'd think you'd be happy about that."

Caldwell stood glaring darkly at the floor.

"Looks like our interference in history didn't accomplish anything after all," observed Hilyard. "Maybe even made Gorbachev more of a hero than he already seemed to be."

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"Hell," muttered Caldwell. "What'm I supposed to tell the Chiefs?" He started toward the door. It scooted obediently out of his way.

Oslovski shrugged and watched him pass. "You could find another historical crux and try again."

"We don't have the funds. Dammit, we were so sure that was the right time and place—the right enemy."

"Sometimes it's hard to know who the enemy really is," observed Oslovski. "Or if there even is an enemy at all."

He threw her a scathing glance and passed through into the hall. She found herself eye to eye with Major Hilyard.

"We have met the Enemy and he is us?" he murmured, quirking an eyebrow.

She smothered her reaction and followed the two men into the corridor, steering them toward the conference room. The rest of the team was already there, along with Colonel Ferris, but Caldwell ignored them, dropping into a chair at the far end of the table. Hilyard seated himself next to him and sat back, watching Oslovski make her way to the head of the room.

"We have evidently failed in our mission," said Caldwell. He glanced at Ferris's suddenly pale, tense face. "The military of the *future,*"—he said the word as if it was odious—"is apparently more of an environmental defense mechanism than a national security force."

"Those people were defending more than the environment, sir," said Hilyard quietly. "They were helping the people of this country defend themselves against natural disaster. They were helping devastated areas rebuild." He smiled. "I'll bet they see a lot more ticker-tape parades than we do."

Caldwell gritted his teeth. There was that unholy feeling of relief again, of something stronger. "What do we do, then? Slink on home with our tails between our legs and admit all the money we've spent went down the rat hole?"

"We could get a head start on the future," suggested Hilyard. "It looked pretty exciting to me, sir."

Caldwell glanced at him, pinning his lower lip between thumb and forefinger. "I suppose we could float some ideas around the Hill . . . before they sack all of us."

"May I make a suggestion?" asked Oslovski.

Caldwell nodded.

"First, let us put history back the way it was."

"How can you do that?" asked Ferris.

"By sending you back to the time of the incident and having you *not* shoot Gorbachev."

Ferris shook his head. "But then, we'd be there twice."

"Not possible," said Shiro. "If we got you there a millisecond before your initial materialization, the pattern of the first event will adjust itself to the second. Think of time as light waves. The first temporal event—your first visit—set up a waveform, if you will. If the second temporal event—the second visit—sets up its waveform just prior to the first one, it will cancel it out, engulf it, reform it."

"Then what?" asked Caldwell.

"Well, to paraphrase Saint Francis of Assisi," said Oslovski, "Have the

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courage to change what you can, the serenity to accept what you cannot change, and the wisdom to know the difference. Accept peace. Get used to it, and to the idea that you *do* have a peace-time role that's more than just training for the next war—the war that won't come. We can help you do that. Dr. Keller could help you set up a program to ease you into that peace time role. The future doesn't have to be miserable just because you have no enemies." She nearly crossed her eyes at the sheer absurdity of the thought. "Judging from Major Hilyard's description of the future, I'd say you'll have lots to do . . . and lots of support in doing it."

Caldwell chewed his lip and thought. Then he glanced at Hilyard. "What do you think, Major?"

"I think it's worth a shot . . . sir."

"Ferris?"

"I-I can't say, sir. I . . . I don't know. This peace . . . it isn't real. It *can't* be."

"Only time will tell," observed Oslovski. "You know, back in the early 20th century a gentleman named Abbas Effendi said, 'Why not try peace for a while? If we find war is better, it will not be difficult to fight again.' " She spread her hands toward Caldwell, pushing the ball into his court.

"You'd be willing to set up counseling clinics, uh, reorientation, or whatever?" he asked.

"Whatever it takes," said Oslovski.

"Damn!" Caldwell slapped the table with the flat of his hand, making everyone jump. He pointed a finger at Oslovski. "You've got my back to the wall, doctor. I've got no choice and you know it. It's either put up, or shut up and go back empty-handed. I'll get the Chiefs up here. You can start your psycho-stuff on them while I package a few ideas and try to sell them on the Hill. Shouldn't have too much trouble with the Environmental lobby, I suppose. Right now, I've got to lie down. I've got a hell of a headache."

He pushed himself away from the table, rose and left; Ferris trailing behind him like a woebegone pet.

Hilyard sat where he was and smiled at the tabletop. The tension in the room mounted by the second. Finally, he got up and glanced down the table at Oslovski. "I don't know how you did it," he said. "And I'm not sure I want to know. There's a part of me that wants to blow the whistle on you, even though I couldn't prove a damn thing . . . at least, not without implicating myself in certain matters. But there's another part of me that knows what you did was right . . . for everybody concerned."

He gave the circle of stunned faces a long, lingering look, then nodded and moved to the door, stopping just short of the pressure pad. He turned back. "One thing I've got to know: when did you play out that little scene Caldwell and I just saw?"

Oslovski cleared her suddenly dry throat. "Two days ago in the theater downstairs."

He nodded, smiling. "Thank you," he said. The door slipped open to let him out, then closed silently behind him.

Less than a month later, the Joint Chiefs of Staff made a ground-breaking proposal to Congress that instead of

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mothballing fleets, bases and men, the government embark on a military overhaul, converting whatever was convertible to peace time use. Battleships could fight oil slicks, tanks could fight fires, troops could learn to build shelters for hurricane victims, shore up leaking levees and plant forests.

The EPA loved it, GreenPeace was ecstatic, the Red Cross was more than grateful for the offer of troops and equipment to aid in their relief efforts. The Chiefs spoke of global applications and the United Nations applauded and handed them a list of ideas as long as the Great Wall of China.

"I would love to take credit for all this," said Vance Keller, scanning the latest edition of a national news magazine, "But to tell you the truth, the counselling program hasn't been as much of a factor in the conversion process as we expected. Oh, there are the inevitable individuals who are having trouble accepting the sudden shift in orientation—"

"Ferris?" Magda Oslovski glanced over the top of her coffee cup.

Vance puckered. "Actually he's doing OK. He's finding a great deal of comfort in playing Gamaliel."

Magda raised her eyebrows questioningly.

" 'If this work be of men, it will come to naught,' " he quoted. "He's been studying his scriptures a lot. He's come up with some interesting alternatives to the party-line interpretations of prophecy." He grinned. "Vahid is overjoyed—Ferris has been asking all sorts of questions about Muhammad and Islamic prophecy. . . . Anyway, most of the G.I.s we've interviewed seem to be happy to be beating their swords into ploughshares. Practicing for war takes a lot out of a person. If you want my honest opinion, I'd say General Caldwell and his bunch were a lot less keen on being heroes than they imagined they were."

"Oh, but they *are* heroes." Magda fielded a folded page of flimsy newspaper nylon. A half-page color picture of a glowing General Caldwell with his young aide, Lieutenant Colonel John Hilyard, smiled up from the glossy sheet under a banner headline announcing Project Ploughshare. "At least, I'm pretty sure Saint Francis would have said so." ■

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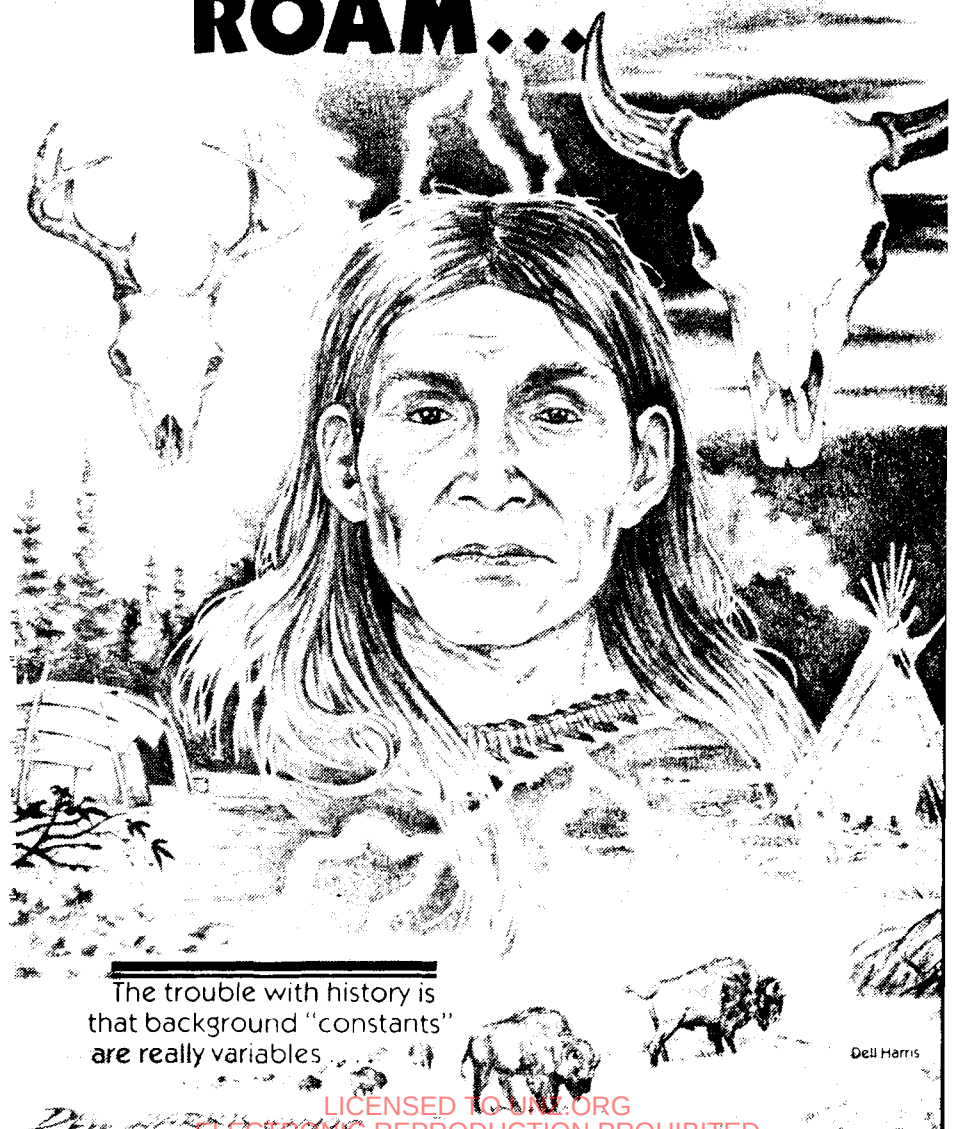
John & Mary Gribbin

WHERE BUFFALO ROAM...



The trouble with history is that background "constants" are really variables . . .

Dell Harris

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Why do traditional "Cowboy and Indian" movies represent the native Americans as nomads who followed the herds of "buffalo" (actually bison) across the plains of North America? The answer, though far from simple, has to do with a change in climate that destroyed a settled Amerindian civilization in the thirteenth century, at the end of a period of warmth known to climatologists as the "little optimum." This period of adverse weather has recently become of considerable interest, as climatologists have realized that human activities are now changing the climate once more. And it shows, in particular, how much the lifestyles and habitats of animals such as bison (and people) are affected by small climatic changes.

North America was not alone in suffering from climatic problems six hundred years ago. As climate declined from the peak of the little optimum and slid into the trough of what was to become known as the little ice age, it was damp and disease, not biting cold, that first set back the growth of western European civilization, in the fourteenth century.

Death and Desertion

The setback in the development of European civilization was heralded by an increase in stormy weather. In the thirteenth century, on four separate occasions disastrous sea floods took the lives of at least 100,000 people in Holland and Germany; the worst of these floods killed more than 300,000 people. Between 1240 and 1362, more than half the agricultural land (60 parishes) in the then-Danish diocese of Schleswig were swallowed by the sea; in other coastal regions sand, not water, was the problem, as the strong winds created marching dunes that enveloped many coastal villages and townships, including the port of Harlech, on the west coast of Wales.

Many historians mention bad weather in passing when describing the events of these centuries, but few acknowledge the possibility that the deterioration in climate played a key role in the deterioration of civilization. In his epic *Hutchinson History of the World,* for example, the Oxford historian J. M. Roberts says that the medieval economy was "never far from collapse," and that agriculture was "appallingly inefficient." So, when two successive bad harvests in the early fourteenth century reduced the population of Ypres by a tenth, he blames the inefficiency of the infrastructure of society, not the bad weather—seeming to miss the point that in the preceding two centuries, during the little optimum, harvest failures had been rare, and that is why society had thrived and population had increased in spite of the "appalling inefficiency" of the farmers. No historian could fail to notice, however, that something dramatic happened in Europe in the fourteenth century. As Roberts puts it:

> It is very difficult to generalize but about one thing there is no doubt: a great and cumulative setback occurred in the fourteenth century. There was a sudden rise in mortality, not occurring everywhere at the same time, but notable in many places after

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a series of bad harvests around about 1320. This started a slow decline of population which suddenly became a disaster with the onset of attacks of epidemic disease which are often called by the name of one of them, the 'Black Death' of 1348–50.

But why did the harvests fail? Because of bad weather. And why did people succumb to the Black Death (another name for bubonic plague)? Because they were weakened by malnutrition. In the late thirteenth century, life expectancy in England was about 48 years; at the end of the fourteenth century, it was less than 40 years. The Black Death was partly to blame, along with other killing epidemics of typhus, smallpox and even influenza (which was still a major killer in the twentieth century; more people died of 'flu in a great European epidemic just after World War I than had been killed on the battlefields of the Great War itself). In some regions, half the population was wiped out by these plagues; over the whole of Europe, the population fell by a quarter.

Trouble produced more trouble—searching for scapegoats for the disasters, people often took to hunting witches or persecuting Jews; civil unrest brought uprisings in France in 1358 (the Jacquerie) and in England in 1381 (the Peasants' Revolt). And in many regions the land became depopulated as people deserted the villages and abandoned their fields.

But which came first—death or desertion? Traditional school history books lay the blame for depopulation of rural regions on the wave of plagues. But more recently researchers such as Martin Parry, of the University of Birmingham, have pointed out that the records show that there were many villages with uncultivated land in every part of England in the year 1341, at the time of a great survey known as the *Nonarium Inquisitions*. Farmland was being abandoned, not just in England but across Europe, *before* the plagues struck. Villages were being deserted before the Black Death did its grisly work on a weakened population, and the villages that were abandoned in the wake of the plague were just those which had been most weakened by the preceding families, and had already lost two-thirds of their population before the disease set to work. Famine and depopulation first, and then the ravages of plague, has now clearly been established as the order in which desertion and death altered the face of rural Europe in the fourteenth century; and before the famine had come the detrimental change in climate. The face of rural America was altered no less drastically.

Cowboys and Indians

The Mill Creek people, who lived in the northwest of what is now Iowa, were the local representatives of an Amerindian culture that spread across the Great Plains during the little optimum. From the foothills of the Rockies to Colorado, Nebraska, and even further east, between about 900 and 1200 A.D. people lived in settled villages in the valleys, growing corn on their farmland and hunting deer in the woods, where oak and cottonwood trees thrived. The

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period of greatest success of these farmers exactly coincided with the heyday of Viking voyages around the North Atlantic, and it had its roots in the same climatic pattern. The pattern of winds around the Arctic was weak, confined to high latitudes, and displaced away from the Atlantic Ocean.

With a shrunken circumpolar vortex, displaced towards the Pacific side of the Arctic, the prevailing winds around the Arctic came northward around the Rockies, and were relatively weak. Moist air systems, pushing up from the Gulf of Mexico, could penetrate far to the north bringing life-giving rain with them.

But when the circumpolar vortex expanded and pushed south, as the world cooled, stronger westerly winds at lower latitudes blocked the path of these moist weather systems up from the south. The westerlies themselves contained very little moisture, because they had lost it all in climbing over the Rockies—the plains lie in the "rain shadow" of the Rockies, and the stronger the westerlies blow the further east that rain shadow extends. All this is clear from modern studies of weather patterns. Occasional months, or years, when the circumpolar vortex expands and the westerlies are strong can be used as analogs for whole centuries of increased vortex activity long ago.

In the 1960s, climatologist Reid Bryson and anthropologist David Baerreis, both of the University of Wisconsin, decided to investigate how such a strengthening of the vortex affected the farmers who lived on the plains a millenium ago. They knew how the climate around the North Atlantic and in Europe had changed after about 1200, and the impact this had had on Norse and European society. But nobody had investigated how and when any associated climatic changes might have affected the contemporary cultures of North America. In the best scientific tradition, Bryson and Baerreis *predicted* that the expansion of the circumpolar vortex and the increasing strength of the westerlies must have made the plains dry out in the shadow of the Rockies, with corn withering in the fields and the forests drying up and disappearing in their turn. Then, they set out to obtain archaeological evidence in support of their theory, and to find out how the Mill Creek people had adapted to their changing circumstances.

The Mill Creek region was chosen for their study because it was known to be the site of abandoned villages (shades of Europe in the fourteenth century), which had not previously been thoroughly excavated. When the site was excavated by the Wisconsin team in the 1960s, it provided a wealth of information about the way people had lived there, from 900 to 1400. Accurate dates for remains from different layers below the surface were obtained by a standard technique known as radiocarbon dating, which involves measuring the residual traces of radioactivity in carbon atoms from the remains of once-living plants or animals. The technique became headline news in 1988, when it was used to date the Turin Shroud and proved that

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it was an artifact less than a thousand years old, and not the burial cloth of Jesus Christ. For Turin Shroud or Mill Creek bones, the technique is the same. Radiocarbon is produced naturally by the interaction of cosmic rays from space with the atmosphere of the Earth, and so it is present in tiny quantities in the air that we breathe and that plants and animals use as a source of carbon. When the plant or animal dies, the amount of radiocarbon in its remains declines steadily in a known way, as the atoms decay. So measuring the amount of radiocarbon present today tells you how long it is since the plant or animal died.

The Mill Creek people ate a lot of game, and left a lot of bones behind. The remains at one site included bones from bison, deer, elk, fishes, birds and rodents, as well as other unidentifiable fragments. The Wisconsin researchers looked at the proportions of bones from deer, elk, and bison as the centuries passed. Taking just these three species, in about 900 A.D. nearly 70% of the bones were those of deer, just over 20% were elk and only 10% came from bison. Up to 1100, although the proportion of elk bones declined dramatically while the proportion of bison bones rose, there were still more deer bones than bison bones. But after 1100 there were more bison bones than deer, and by 1200 the remains were 70% bison and 30% deer, with just a few elk bones. At the same time, from 1100 onwards the *total* number of bones found at the site declined as the years passed.

The significance of this change is clear. Bison eat grass, and deer browse on trees. A prolonged drought that killed trees would have a severe adverse effect on the number of deer, but as the forests declined and the grass spread there would be more plains for the bison to roam. At the beginning of the dry times, it was easier to find bison than deer, and the changing diet of the Mill Creek people reflected that. As the drought became worse and the plains became more arid, though, even bison became harder and harder to find.

But how did the drought affect their corn? Bryson and Baerreis decided to measure corn production by the number of broken pieces of pottery found in different layers of the soil, corresponding to different ages from the past. Pots were needed both to store grain and to cook it, so the number of potsherds is generally accepted as indicating how much grain there was at the time those pots were made. After about 1200, the number of potsherds found at the Mill Creek site dropped dramatically. The total number of bones from elk, deer, and bison had already started falling even before then, around 1100, just at the time when bison became a more important part of the diet than deer. Together, the various pieces of evidence paint a clear picture—during the twelfth century, the plains began to dry out, and the lifestyle of the Mill Creek people changed as a result. By 1400, there were no more bones or potsherds being left at the Mill Creek site. The villages, like many other villages in the plains, had been abandoned. But, unlike the Norse in Greenland, the Amerindians had not

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simply been killed off by the bad weather.

Other evidence from many village sites across the plains supports the broad interpretation of a change in the way of life of the plains dwellers, and analysis of remains of pollen in the soil, for example, confirms that forests died out and were replaced by tall grass prairies. Now this, surely, begins to sound more familiar than our earlier story about Amerindian villagers living in settled communities on the Great Plains, farming corn and hunting deer in the woods like Robin Hood. "Everybody knows" what the plains Indians were like, from the cowboy movies we all watched as children. Plains Indians were nomads, not settled farmers; hunters who lived in tents and followed the great herds of bison (mistakenly called "buffalo" in most of those movies) as they roamed across the grassy plains. That, indeed, was the kind of "Red Indian" culture that was encountered by European pioneers moving west into the plains in the eighteenth century, and the open prairie provided the range land needed for cattle ranching on a large scale, which in turn provided work for the tough cattle hands of the old west, who became the stereotypical cowboys who shared those movies with the stereotypical Red Indians.

Cowboys and Indians, as portrayed in the movies of our childhood, owed their existence to the drying out of the Great Plains as the circumpolar vortex expanded and the world slid into a little ice age.. ■

John and Mary Gribbin's recent book "Children of the Ice," is published by Basil Blackwell.

●All things are to be examined and called into question. There are no limits set on thought.

Anonymous

●There's nothing new under the sun, but there are lots of old things we don't know.

Ambrose Bierce

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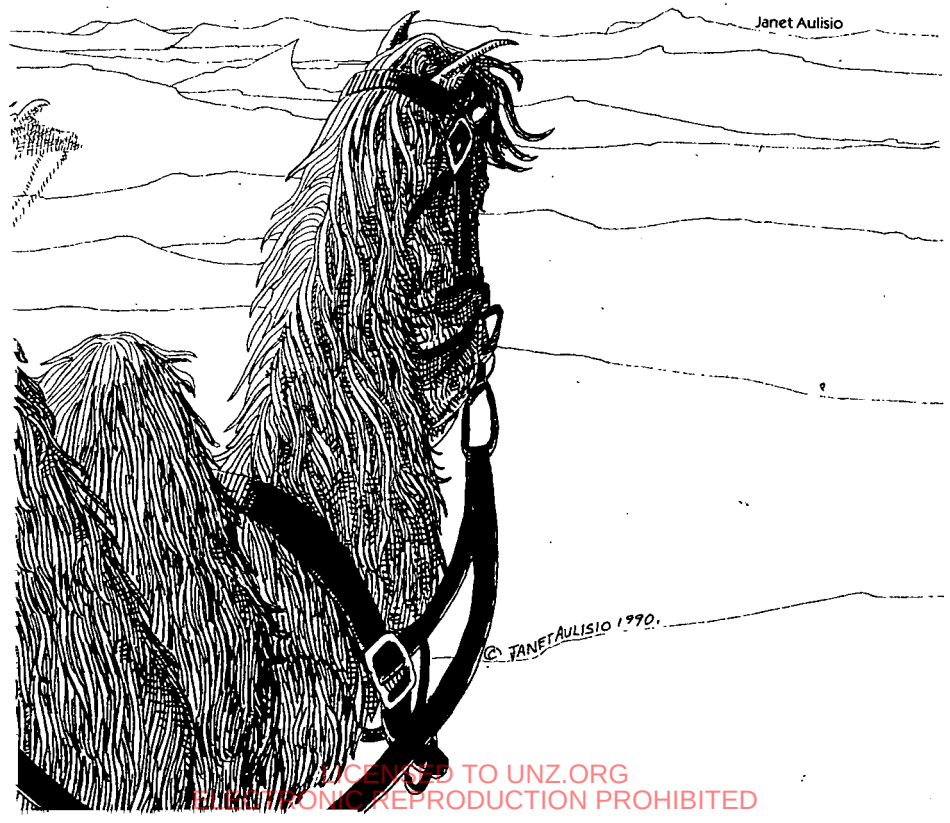
TO TAME A TIGER

Mary Caraker

The obvious way to achieve
a goal is not always
the one that works.



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Morgan Farraday bounced awkwardly between the humps of the six-legged pack animal. Its shaggy hide stank, and the labored snuffles of its breathing sounded like the last stages of a catarrhal lung disease.

Around her stretched dry brown desert, with low hills in the distance reflected upside down on the shimmering surface of a lake.

Morgan knew the lake was a heat mirage, and she blinked her eyes in a futile effort to clear her vision. She had been riding since sunup, and the flaming ball of Beta Hydri was now directly overhead. Only mad dogs and Space Corps teachers, she thought. And Hydrans. Her guides sat slumped on their own heavily laden mounts, one ahead of her and one behind, to all appearances asleep.

It looked like there would be no stopping for rest or food or water. "That stretch of desert's a magnet for raiders," she had been told at the shuttle port. Renegade Fermini preyed on caravans carrying supplies to the hill settlements, and Morgan had seen that her guides, for all their apparent apathy, were well armed.

A sharper than usual jolt almost toppled Morgan. She clung to her saddle horn as the gait of her mount changed, its legs stretching out into a bone-jarring gallop. A hot wind stung her face and she bent low to escape it. When she managed to glance backwards, she saw a tiny puff of dust.

It grew steadily larger. Both guides were alive now, firing scattergun blasts that couldn't possibly connect.

The pursuers continued to gain. Morgan could make out figures in the dust cloud; a dozen at least. They fanned out, still closing the gap.

The lead guide cursed and reached along the back of his mount, cutting loose his entire mound of supplies. The other guide followed suit, and both shouted at Morgan to do the same.

Morgan hesitated. Her duffel contained everything she had brought for a year on Hydra: clothing, book and music spools, a supply of Elyrian chocolate, her own brands of soap and toothpaste and face cream. Essential items for a civilized life. How could she throw it all away?

There was no time to deliberate. The rear guide swept up to her and past, and Morgan saw that he didn't much care if she chose to save herself or not. She pulled herself forward on the saddle, reached around the smelly hump and gave up all her possessions to the desert.

Lightened of their burdens, the three animals fairly flew. When the raiders stopped for their loot, Morgan's party was a safe distance ahead.

The guides slowed their mounts, the animals wheezing now with the sound of boots squelching in thick mud. The odor from their sweating hides was worse than before, and only the certainty that she would be left where she fell kept Morgan in the saddle.

She had been warned what to expect on Hydra. The desert planet had been colonized by hard-core convicts two centuries before, and the harsh conditions there had done nothing to soften the fierce natures of their descendants. Divided into warring tribes, the Hydrans competed for rangeland, for water, and

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above all for their only source of wealth, the mineral tectite.

Morgan's prospective hosts, the hill-dwelling Fermini, controlled the richest mines. Space Corps Central had been pleasantly surprised when they had requested a teacher. "It's a hopeful sign," the posting director had told Morgan when she was given the assignment. "They've always been hostile to outsiders. Maybe they're finally ready to join the twenty-fourth century."

Morgan didn't think so; not from what she had seen so far. Her Fermini guides were glowering, thick-bearded brutes who hadn't uttered a friendly word, either to her or to each other. They were likewise oblivious to her comfort, and Morgan was parched with thirst. Perhaps, she thought, like their hump-backed beasts the men could go dry for a day, or perhaps they were competing in endurance. Whatever the reason, Morgan saw no sign of a water flask.

She turned in her saddle and made drinking motions at the rear rider, but there was no response.

Probably she'd committed a gaffe by asking! Grimly Morgan pulled her head covering over her face. If they were testing her, she'd show them that she could endure as well as they. She slumped as low as she could, closed her ears to the snuffling and tried to accommodate her bones to the jolting rhythm. The hardest task was not to think of water.

When they dismounted at the hill camp, Morgan forced herself to stand as straight as her guides. Walking was more difficult, but at least she made it on her own into the tent.

Three bearded, stern-faced Fermini awaited her. Morgan scarcely glanced at them, her attention fixed immediately on the table, on the jar of colorless liquid and the six glasses.

One of the men was speaking, and Morgan attempted to concentrate through waves of dizziness. She caught only occasional words, but it seemed to be a speech of welcome. She croaked some thanks in response, trying to keep her eyes away from the water.

No one else appeared to notice it. Morgan's two guides stood with easy nonchalance as they reported the raid and the loss of the supplies. Morgan felt herself sway, and steadied herself with an arm on a tent pole. Someone else would take the first drink, she vowed.

Finally one of the guides approached the table and filled a glass. He drank half; licked his lips and left the tent.

There was a visible relaxing. "Go ahead." The man who had welcomed her indicated that Morgan should drink. In his eyes she thought she detected a measure of respect.

In Morgan's own tent, a Fermini woman brought her water for washing. She also provided her with fresh clothing—wide-legged pants and a loose tunic—and salve for her saddle-chafed thighs.

The woman was frankly curious and not very reassuring. "You think you can teach our kids? You look too soft, they'll never listen to you. God knows why they sent for an off-worlder anyway. We've gotten along fine with our own teachers."

"You don't like it that I'm here?" It was a rhetorical question; Morgan could see that she didn't.

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The woman shrugged. "It's not my affair."

"Whose is it, then? Someone must have wanted me." Morgan's information about the post had been scant. Because she was experienced in difficult situations, the Corps apparently trusted her to somehow land on her feet. She determined to find out now whatever she could.

"The Council," the woman replied. "Borg Fargo and his cronies. They'll tell you what they expect from you. It's got to do with trade, that's all I know. How to get more for our tectite, so we can finally blast the Orkans and the Dhrus and every last thieving raider into the bloody bits they deserve."

Morgan recoiled at the hatred in the Fermini woman's eyes. She trusted it was directed solely at the aforementioned enemies, but even so the thought of the uses to which her teaching might be put was a troubling one.

The woman left, and Morgan spent a mostly sleepless night. A prime dictum of the Corps was to teach their petitioners only what they wanted, with no attempt to change cultural patterns. Morgan often hated the position it put her in, and it looked as if this posting would be no exception. She wondered, not for the first time, at her choice of a career.

The next day, with the same guides, after a two-hour ride through scrubbrush canyon country, Morgan arrived at the Fermini city of Golan. Perched on a rocky eminence, it resembled an armed fortress. Gun turrets topped its high walls, and guards patrolled the gates.

Inside, the one- and two-story buildings were unadorned plasteel prefabs and squat brick squares—the strictly utilitarian look of a raw colony. Morgan was directed to one of the larger houses, and then into a cluttered office.

"Borg Fargo," said the man who rose from behind a desk to greet her. He was tall—at least six and a half feet—and gaunt, with piercing blue eyes and a long, weathered face. The calloused hand he offered Morgan swallowed her own. "So you arrived safely, though I hear you were bitten by the dogs who foul our desert. Perhaps you can understand already why we need you."

"Not really," Morgan answered. "I teach literacy, not warfare tactics."

"Trade literacy?" Fargo motioned her to a chair.

So her first informant had been correct. Morgan cautioned herself to proceed carefully. "Yes," she said, "I can teach your children the mechanics of trading. Diplomacy, making treaties and all that."

"I knew it! I had a hellova time convincing the others—"

Morgan held up a hand. "First, though, the kids have to be grounded in the fundamentals of reading and writing and computation. I can't promise anything until I find out what skills they already possess."

"Oh, they're no dummies. None of us are." Fargo slammed a fist onto the desk top. "And we're sick of being cheated every time we sell a load of ore. I know what tectite's worth, and I know there are ways of getting what we need for it." His face tightened. "The hell with SEF's nuclear weapons embargo!"

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"Hey, I can't help you to break the law. If that's what I'm here for—"

"You're here to teach a special class of kids, including my own boy. Teach them to make trade treaties. That's all you need to concern yourself with."

Borg Fargo's tone invited no argument, and Morgan didn't attempt any. She'd been in the Corps, the teaching arm of Space Exploratory Forces, long enough to know her limitations. *Teach them only what they ask for.* So it was to be a class in interplanetary trade, and hang the consequences. She nodded and rose. "If you'll show me the school, and where I'm to live. As you know, I lost all my luggage."

"Filthy raiders! I know damn well they're in the pay of the Dhrus." The desk top trembled again under a blow. "But we'll have our revenge, and you might even get your gear back. In the meantime, we'll provide you with everything you need. You'll stay at my house." He barked an order into a speaker, and a young woman came. "Take—Farraday, isn't it?—to her room. Show her the school." To Morgan: "When can you start?"

"Right away. That is, as soon as I'm settled."

"Tomorrow, then."

Morgan followed the tall young woman, who bore a striking resemblance to Borg Fargo. Her features were softer, however, and her long face could have been pretty if her expression had been less petulant. "Your father?" Morgan asked.

"Yes. I'm Minna Fargo." Her mouth formed a grimace. "Housekeeper, chief cook, flunky, you name it. Whatever you need, just ask me." She flung open the door of a small room containing a narrow cot, a table and a chest. "There are clothes in there." She pointed to the chest. "Not what you're used to, I'm sure, but it's hard to get supplies. You may have noticed, we're a bit short on luxuries."

"Because of the desert raiders?" Morgan asked.

Minna shrugged. "Them and the wars. It's always one war or another. It's our life."

On the way to the school, Morgan learned from Minna that the conflict with the Dhrus, over an arable valley watered by mountain streams, had been going on as long as she could remember. The Dhrus were presently in possession, but the Fermini hoped to force them out by damming the streams, and present skirmishes were centered high in the mountains.

The Orkan war, on the other hand, was a defensive one, protecting tectite mines near the Orkan border. More men were fighting there than mining, Minna said.

No wonder Hydra was so poor, Morgan thought. Though in a way it was a blessing, too. If they had air power, even without atomics a city such as Golan could have been leveled. She wondered if SEF was violating its own non-interference directive by deliberately keeping tectite prices low.

The school, as Morgan expected, was no-frills basic. That she could handle, but she wasn't so sure about the pedagogical methods that seemed to prevail. It was no-holds-barred competition, from primary tots fighting over their snacks, with the strongest receiving the lion's share, to an older kids' spelling bee in

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which half the class was too intimidated by bullies to even participate.

Morgan talked to the teacher of the spelling bee class, a silver-haired woman named Pearl Chowd. "You won't have any problems," Pearl said. "You won't even have to offer your own rewards. I have half your kids in this room, and they all know that Borg Fargo has plans for anyone who does well for you. They'll be breaking each other's arms to be on top."

Morgan studied the students, now racing to complete a page of math problems. They looked to be in their middle teens, hard and muscular and self-possessed for all their tattered clothing. Borg Fargo's son she picked out at once. The family resemblance was strong, as was the air of determination. When he saw another student about to finish before him, he reached across the aisle, seized the offending paper and tore it up.

"Hey, you bastard!" cried the victim. A scuffle ensued, and while the two pounded each other, a third student handed in her paper with a screech of triumph.

"Bad luck, Jared," said Pearl to the glowering Fargo scion. She scanned the paper quickly and made a notation in her book. "Points go to Jessie on this."

"What's the reward?" Morgan asked.

"A hundred credits of store goods, at the end of the term."

"Out of your salary?"

Pearl laughed. "Of course not! What kind of a system do you come from, anyway? It's part of the school budget."

Not a system as twisted as this, Morgan thought. But she only said, "I see," and went to inspect her own room.

Seated at her desk and staring at the rows of empty ones, she did indeed try to see. In a world as marginal as this, where the price of failure—of a crop, of an ore vein, of a war—might well be death, the Hydrans had chosen one method to survive, and their children learned it early.

Like it or not, she was caught in it. Morgan sighed and chewed a pencil. It galled her to bend entirely to the wind, especially when it was blowing so clearly in the wrong direction. Maybe . . . just maybe she could inject a new element and still stay within the bounds of her assignment.

She thought back, over old Academy classes, until a teaching method came to mind that could possibly be her answer. She found paper and began to plan her first lessons.

The next day Morgan witnessed her first failure. She had divided her fifteen students into groups of five and instructed them to draw up an imaginary national budget for a year. Each group had chips representing money, to be allocated between health services, social security, national defense, foreign aid, education and public works. The exercise should have taught them something about reaching agreements, but it fell sadly flat. Jared Fargo took immediate charge of his group, dictated the budget and quashed any opposition with a raised fist. Jessie Eisen likewise appointed herself undisputable head of her five, and a wiry redhead with a scarred cheek dominated the third group. The budgets they handed in were almost identical, with the majority of chips

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going to defense and none at all to foreign aid.

"Who won?" Jared asked. The three leaders eyed Morgan expectantly.

"It wasn't a contest," Morgan said. "If it had been, you would all have lost." She stilled the cries of protest. "I didn't see cooperation or compromise in any of the groups. If you expect to be diplomats . . ."

The blank, resentful stares dissuaded her from lecturing further. The students had no understanding of the skills they would have to learn. Jared cracked his knuckles and Pousti, the red-haired youth, perched insolently atop his desk. "Only weaklings compromise," he said.

Morgan returned his stare. "Then why am I here?" she asked. "Apparently some on your Council are ready to try new methods. They're putting a lot of hope and faith in what can happen in this room."

"Yeah," Jared said. "My old man's sick of getting pushed around by SEF double-talkers." He laid a hand on Pousti's shoulder. "This is *his* idea, so siddown and listen!"

Pousti whirled and struck Jared a blow on the chin. The desks toppled, and a space cleared immediately for the combatants. They slugged away, to cheers of encouragement, and Morgan ran outside for help.

Pearl Chowd came out of her room. "Let them finish it," she advised, watching the combat calmly. "With this bunch, it won't be the last."

"We'll see," Morgan said. She set her lips, and when a kick from Jared sent Pousti sprawling, she intervened with an arm lock on the still belligerant victor.

"OK, you can let me go," Jared muttered. Pousti rose groggily to his feet, and everyone returned to their seats.

"So." Jared glared warningly at Pousti before he addressed Morgan. "What's all this we've gotta learn about compromise? Lay it on."

Everything in his attitude apprised Morgan of the hopelessness of her task. She abandoned her carefully prepared plans and assigned the class reading. It wouldn't mean much, she knew, but perhaps by some miracle they would see something pertinent in the histories of other planets.

The students read quietly and Morgan wondered, as she had a hundred times in other situations, just how much influence on them she could actually have. A year in their lives, with perhaps one of two who would remember her occasionally when they were grown. Not much of a substitute for children of her own. Morgan was almost forty, and the heady excitement of her early years in the Corps was wearing thin. Oh, there had been exotic worlds and handsome spacers and adventures enough. There had even been the rare satisfactions of opening up young minds. Leila on Hedron II. The tactile children of Parth. None of whom, however, she would ever see again. Whatever impressions she had made on a dozen worlds would grow there without her. And here she was again with a new, blank slate. She sighed. A particularly obdurate slate. She pushed back a lock of brown hair that already showed traces of gray. For better or worse, it was the life she had chosen.

Jared looked up from his book and

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indicated the pages he had already read. He glanced at his neighbors to satisfy himself that he was ahead, and gave her a grin.

At least he was eager, Morgan thought. It was something, at least, to work with. This assignment might well be one of the worst, but she wasn't going to accept defeat meekly.

The budget exercise had been a mistake. She would have to begin on a much more basic level, she realized, teaching them co-operative skills they didn't even know existed.

She began after lunch break, with three different color-coded map jigsaw puzzles, all jumbled, with each student receiving an equal assortment of pieces. The aim: to sort themselves first into a group for each puzzle by trading pieces, then to work them, with points deducted for grabbing or fighting.

Jared and Pousti ended in the same group, and lost so many points that they came in last. They took it badly, and when Morgan rewarded the winning team, muttered audible comments about "stupid kid games" and "phoney SEF teachers."

Jared was still grumbling at dinner, which Morgan took with her host family.

"You didn't come out on top today, I take it," Borg Fargo said to his son. He didn't look pleased. "What happened?"

"Ask *her*." Jared directed a black-browed scowl at Morgan.

"The class has a lot to learn, if they're to become diplomats," Morgan said. She kept her eyes on her plate, where she sawed with her knife at a piece of tough gray meat.

"Then listen up and learn fast," Borg said to Jared "And don't come belly-aching about it to me. You know what I expect." He inspected his own plate and pushed it aside. "Ergip! What's the matter, Minna, we out of real meat?"

Minna twisted her mouth. "Have you been to the markets lately? Until the caravans can get through again—"

"Damn those Dhrus!" Borg overturned his chair as he rose. "I can't eat this ratmeat; you'll have to do better than that." He turned back to Jared. "You got schoolwork tonight?"

The boy shook his head.

"Then you can come along on a little raid of our own I've organized." He grinned at Morgan. "Practical diplomacy: give the bastards a taste of their own thievery." To Jared: "The pass at Oborroth . . ."

Father and son walked out together.

So much for everything she'd tried to accomplish today, Morgan thought. At least where Jared was concerned.

"I don't know what you're trying to teach him," Minna said, "but if it hasn't to do with pulverizing our enemies, you might as well forget it."

"It has to do with ending the wars," Morgan said. "And you're right. My chances of success are pretty slim." She eyed her food suspiciously. "Is it really ratmeat?"

"An ergip is a kind of a rodent. It's about all we can catch up in these mountains. If you're hungry enough, it doesn't taste so bad." Minna took a small bite, grimaced and put down her fork. "Anyway, what does he expect me to do? The soldiers get all the best rations."

Morgan had been hungry, but no longer. She ate part of a coarse-textured

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bun and declined a watery pudding. If only she hadn't lost her chocolates! She found herself silently fulminating against the raiders, too.

Minna pushed her food around on her plate. "In the Bernay Valley, that I told you about, the Dhrus have dairy herds. Milk and cheese and real custard. If only we could get it back!"

"But if you dry up the streams—"

"I know." Minna spread her hands. "But what else can we do?"

"Do you have any friends at all among the Dhrus?" Morgan asked. At Minna's shocked expression, she amended, "Have you even met one?"

"Only once, when I took food to some captives. One of them was a chief's son, that Dad thought he could use to some advantage. He got away, though, and Dad swore he'd learned his lesson—no more prisoners. So you see, I haven't had much opportunity to socialize."

"What did you think of the ones you saw?"

"Oh, they looked about like us. The chief's son was even kind of—but what's the point? They're our enemies."

"Yet you're tired of the wars."

"Who isn't?" Minna gathered up the plates, scraping the uneaten meat into a container. "That's what you're here for, to help us put an end to it once and for all."

Morgan followed her out and helped her with the washing up. The kitchen was primitive, with water heated on the stove. Yet in the streets she had seen soldiers armed with expensive pulse-guns. Once more she cursed her assignment, and once more, she determined to twist it to her own ends.

Borg and Jared returned, triumphant, from their raid, but the small victory appeared to have little effect on the course of the war. Ergip stew continued to appear at the meals. In the school, Morgan continued her own uphill battle. Her class studied model trade treaties, with special attention to the laws of supply and demand. She also kept them working puzzles, ignoring their grumbling, until they could complete them cooperatively without fighting. She then graduated them to more difficult group assignments: making shopping lists, planning a model city, charting a road system. Anything that required the members to pool their efforts and their research. Jared complained less as his points began to pile up, but all of the young people worried about the poor shopping choices they would have with their hard-won credits at the end of the term.

When she thought her students were ready, Morgan re-introduced her original national budget project, minus the category for defense. "You can *pretend* the wars are over," she insisted. "Other worlds have managed it." She asked for detailed analyses of the budgetary choices—charts, sketches, projections—an assignment that required both reaching agreements and sharing the workload.

It seemed to start off well. The students worked together now without too much arguing, though Morgan wished she didn't have to dangle the reward. Jessie and Jared and Pousti once more headed their respective groups, and after the first day on the project all three

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stayed late to look over what had been turned in.

Jessie studied a sketch of an irrigated farm system made by someone in her group. "I think it could actually work," she said. "Maybe some day—"

Pousti snorted. "When hell freezes over!" He knocked over her pile of chips with a flick of his fingers. "We'll never have that kind of money."

"We will," Jared said. "Once we—"

"Shut up!" Jessie turned on him fiercely. "I don't want to hear it! No more about tanks and bombs and leveling cities." She shook her sketch in his face. "What would your atomics do to *this?*"

"You're thinking crazy," Jared said. "You're way ahead of where we are now. What you ought to be worried about is what the Orkans would do to it." He turned to Morgan. "I can see what you're up to, but this is all phoney. Pie in the sky. What we should be doing is figuring how to get money or atomics out of SEF. Now *that* would be a project."

Morgan felt a strong current of tension in the room. If it could be directed . . . "And your reading hasn't given you a clue?" she said.

Pousti replied. "Oh, sure. An embargo on all our tectite. It would drive up the price, but the damned Orkans would be the ones to get rich. We'd be cutting our own throats."

"Maybe, if the other tribes could be persuaded to agree . . ." Jessie suggested.

Both boys hooted.

"Of course, they'd never do it," Jessie granted. She sighed and returned to her project. All three worked in silence, and from their glum faces Morgan could guess at their thoughts. At least, Jessie had put a germ of an idea into their heads. For the first time, Morgan walked home in a slightly hopeful frame of mind.

The others had gone on ahead, and she knew she had stayed too late—it was already dark. The city was dimly lit at night, and Minna had warned her about street dangers. Morgan speeded up her pace when she heard footsteps behind her. She wished she had heeded Minna and not started out alone. She wished it even more when the footsteps speeded up, too.

Morgan started to run. Fortunately, she wasn't far from the Fargo house. She was almost there, her pursuer half a block behind, when a second figure emerged from an alley ahead.

"It's her," said the voice from behind. Morgan whirled, but she wasn't fast enough. Before she could extend her finger-needle she was seized and gagged, her hands and feet tied and her head covered with a sack.

"Did we get the boy brat, too?" one of the men asked.

"Don't know," said the other. "We'll find out soon. If we did, we've got Fargo where we want him."

Morgan was hoisted to a shoulder and carried off at a run. She wasn't too worried about her safety: her needle was loaded with enough paralyzing serum to knock out both men and a couple more. But if Jared were taken too, she thought, she'd better bidé her time. And if these were Dhrus, it wouldn't hurt to find out something about them.

She couldn't tell how they got out through the wall, but after a half hour

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or so she was put down while they waited for another group to join them.

The new arrivals reported failure. "The kid was with two others, and they must have spotted us. They went into a house, and soldiers came from everywhere. We were lucky to get away."

"You won't think yourselves lucky when Lempi finds out," Morgan's abductor said. "He'll have your hide."

The other man growled a curse. "He'll have to make do with this one. Are you sure she's the daughter?"

A hand pulled at Morgan's borrowed tunic, exposing the monogram stitched into the neckband. "There's his sign." He pulled off her head sack and shined a light in her face. "You Minna Fargo?"

Morgan didn't answer. She flexed her needle finger, but with her hands tied she was helpless. There would be time later. . . . Now, she resolved to go along with the deception.

The sack was replaced. "She'll talk when she has to," said a rough voice.

Smothered again in darkness, Morgan was tied to the back of an animal she recognized at once by its smell. The jolting ride over what must have been rough country seemed to go on forever. When they finally stopped, she could discern faint light through her hood.

She was marched into some sort of a structure and tied, sitting on an earth floor, to a post. After another long period of time, during which she tried to compose herself by emptying her mind and reciting a favorite mantra, what sounded like a large group entered her prison.

The sack came off, and Morgan faced a ring of scowling, bearded men whose dress was only slightly different from that of the Fermini. She was in a mud-walled hut more primitive than anything in Golan, but through the narrow doorway she caught glimpses of green vegetation.

One of the men thrust a writing pad and pencil at Morgan. He wore a heavy chain around his neck, and at his waist an elaborately tooled pulse-gun holster. Morgan guessed him to be the chief. "Write what I tell you," he said. "And no tricks. I can read as well as you."

"You'll have to untie my hands."

Freed, Morgan rubbed at her wrists. There were too many of them now to attempt anything, but perhaps, if she appeared compliant, they would leave her hands at least unbound.

She wrote what the man, whom they called Lempi, dictated: a plea to Borg Fargo that she feared for her life if he wouldn't accede to their demands. She signed it Minna.

Borg would know at once what had happened. Whether he valued her enough to attempt a rescue she wasn't sure. She rather thought it would be up to her.

"Hey, hold on a minute." A new figure entered the hut. He was younger than the others, with dark, curly hair and a strikingly handsome face. He crouched before Morgan. "Who are you?" To Lempi: "Dad, you've been duped. This isn't Minna Fargo!"

"Are you sure?"

The other man paled. "Look, there's his mark," one said. Again, the monogram was displayed.

"I ought to know," said the good-looking young man. "I saw her a couple of times when they had *me*. I don't know why this woman's wearing her

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clothes—she doesn't even look like a Fermini."

"Somebody leaked our plan and they've given us a ringer." Lempi's face darkened as he glared murderously at his men. "That person's going to pay!" He strode out, and all but his son followed.

The young man continued to study Morgan with a puzzled expression. "Do you know Minna?" he asked. "Did she put you up to this?"

Morgan could sense his disappointment, and not for the loss of a valuable hostage. She would have liked to explore further what appeared to be an intriguing future possibility, but she feared for her own safety once Lempi turned his anger on her.

She beckoned the young man closer. "I'm sorry for this," she whispered as she jabbed him, releasing enough serum to keep him unconscious for several hours. She cut the rest of her bonds with his knife and escaped easily from the Dhru camp, leaving a trail of three other limp bodies.

She turned her stolen six-legged mount in the direction of the mountains. The camp, when she looked back down on it, was in a narrow defile at the beginning of a wide valley. The entire area appeared to be in the grip of a drought, the greenery she had glimpsed from her prison hut a mere illusion of fertility. It grew only on the banks of a dwindling stream, and the surrounding fields were dry and brown. The dairy herds that Minna had spoken of so longingly appeared, at least as far as Morgan could see, to consist of a few dozen half-starved animals.

The victor here would get few spoils, Morgan thought. She imagined the valley as it must once have looked, and silently cursed both the Fermini and the Dhrus.

Her pressing problem now, though, was to get back to Golan. Morgan had no idea where in the succession of peaks and canyons it lay. She decided to follow the stream up, reasoning that it would eventually lead to a Fermini dam. She didn't know if the hills around her were Dhru territory or Fermini, so she avoided the marked trails.

It was hard going. Her beast, fortunately, was sure-footed, but it was also slow. Night found her deep in a rocky wilderness. She spent a miserable night huddled beneath a ledge, listening to her shaggy companion snuffle.

In the morning she sucked up a scant mouthful of water from the cracked river bed. She hadn't eaten all the previous day, and the small drink didn't allay her stomach cramps. She knew, from the position of the sun, that she was going in the right direction but she had expected to come upon some signs of Fermini by now.

Perhaps she was hopelessly lost. The high, flat mesa and chimney-shaped peaks ahead looked totally unfamiliar. However, there was nothing to do but continue to follow the stream bed. Occasionally she passed bleached animal bones, and wondered if hers too would lie there. Who would care? Her mount wheezed and the sun beat down on her. Glamour and romance, she thought. The Corps recuiter should see her now.

She came to the dam at noon, too sun-sick to even dismount. A Fermini guard recognized her tribal dress and

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helped her, and she croaked the words, "Borg Fargo."

She endured another bumpy ride to Golan. Minna greeted her with a hug, but she warned Morgan that her father was in a worse than usual temper. "Something about the school," she said. "He wants you to report to him right away."

"After I've bathed," Morgan said. "And eaten."

Minna carried in water for a squat-bath and fixed a cold meal. Morgan related her adventure, watching Minna's eyes brighten at the mention of Lempi's son. When she was refreshed, she bearded Fargo in his office.

"Took you long enough," he growled. "I've been waiting."

Not a word about her abduction. "Well, I'm here now," Morgan said.

"You won't be, for long." Fargo spilled a folder of papers that Morgan immediately recognized onto the desk. "What's all this nonsense? Roads and irrigated farms and fancy health centers! Are you telling me how to run my country? I hired you to teach trade treaties, not meddle with what doesn't concern you." A vein throbbed in his temple. "You've even got Jared talking about getting together with Orkans. My son! Orkans! And now this fake 'kidnapping.' What secrets have you given away to the Dhrus? You're out, lady. Gone. We don't need your kind here, and I've told that to your SEF bosses."

Morgan's stomach was a tight knot. "You've contacted them?"

"As soon as I found these"—he slapped the pile of papers—"and heard what you've been putting into kids' heads. I sent straight to the helex station, and here are what better be your marching orders." He handed Morgan a helex printout, in code, from Space Corps Central.

She couldn't translate it on the spot, but it did indeed appear to be an assignment release. "I'll need transport to the shuttle," she said, trying to maintain what dignity she could. "And couldn't I at least say goodbye to my students?"

"No!" he thundered.

Morgan backed away. "Then . . . I have nothing to pack, so I can go any time." She knew it would be useless to plead, but she couldn't resist one final observation. "I *was* teaching them diplomacy."

Fargo's roar sent her scurrying out the door.

In her room, she held the helex in trembling hands. Fired. Sent packing in disgrace. She'd had unsuccessful assignments before, but at least she had managed to fulfill her contracts. This would be a blot on her record that she could never overcome.

She dreaded decoding it, but she finally steeled herself and spread it out on the table.

"Morgan Farraday . . . contract cancelled at request of subscriber . . ." All the usual legal mumbo-jumbo, nothing at all personal. It would come, though. The chewing-out. She proceeded slowly down the page.

"New assignment." Morgan straightened with a jerk. She wasn't being recalled to Central Station? She transposed the symbols hurriedly now, holding her breath. "The Orkan tribe. At the request of Chief Ali ir Fawd. Report immediately."

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At the bottom of the page was an explanation. The Orkans had apparently heard rumors of a teacher supplied by SEF as a "secret weapon" to the Fermini, and offered a high price to lure her away. Since Fargo had so abruptly terminated her contract, Morgan was to accept their invitation. They would pick her up at the shuttle port. "Same aims, Farraday," the message concluded. "We trust your discretion."

Morgan breathed again, then covered her mouth to keep from shouting. They knew, and they approved! All of her nagging career doubts evaporated. So what if no one on Hydra remembered her fifty years from now? The seeds she had planted and would continue to plant would grow, and what better memorial could she ever ask for?

Thinking of Minna and the handsome young Dhru, she didn't even think it would take fifty years. Not if Jared was as forceful and stubborn in his new views as his father.

What would the Orkan young people be like? she wondered. "Minna, I'm ready to go," she called. She could scarcely wait. ■

●Japan has for several years been treating molecular systems engineering as a key to 21st century technology. If the rest of the world wishes to see cooperative development of nanotechnology, it had best wake up and start doing its part. It might also be wise not to escalate an international war of words, tariffs (and more?) over such trivia of late 20th century industry as cars, VCRs, chips, and whatnot. In the late 19th century, guano deposits were of enormous economic and strategic value, but this evaporated in the early 20th century with the advent of the Haber process for nitrogen fixation. Let us not disrupt productive alliances over the modern equivalent of guano.

K. Eric Drexler

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Jay Kay Klein's biolog

Long ago, when this magazine was called *Astounding*, A.E. Van Vogt wrote of a future in which atomic motors were almost universally serviced by machinery, but the very best tune-ups were done by hand. Mary Caraker is one of the few *Analog* writers today who was educated by hand, in a one-room schoolhouse in a rainy, isolated area of northwestern Oregon. High school wasn't much larger. She thinks it ironic that "modern" educational factories spend so much money with such poor results.

After acquiring degrees in English Literature, a B.A. from Willamette University in Salem, OR, and an M.A. from San Francisco State University, Mary became a teacher herself: a year of freshman English at the University of Oregon, a year at a girl's school in Honolulu, and then a secondary school in the San Francisco Bay area. She's of Finnish descent, and interested in Finnish folklore, especially the Kalevala. Allied to this is a curiosity about people as revealed through the examining lens of anthropology.

Mary views a writer as a shadowy, unreal overhead "puppeteer," with only the characters onstage lit up for the audience. Yet, a writer's stock in trade is the knowledge and personal experiences encountered along the way to any given story. Her first story appeared here in the January 1983 issue, about a space-faring female teacher who solves a planetary murder mystery through her knowledge of English and Finnish literature, coupled with the understanding of how primitive societies function.

Starting to read science fiction as a young adult, she found it to be her favorite literature and finally decided to write it full time. Husband Emmett, a former navy officer and engineer, then discovered he really liked science fiction, and now urges going to as many SF conventions as possible.

Like other writers. Mary finds that *Analog* will accept stories with far less hardware and more human software than generally thought likely for a magazine that is the leading exponent of hard-science stories. She does note that though editor Stan Schmidt is open-minded about the strange and wonderful happenings that flow from kinks in human software, and even defective hard-wired circuitry, he does insist that known physical laws not be violated gratuitously.

A third novel came out a few months back, *The Snows of Jaspre* from Houghton Mifflin, about the continuing adventures of the space teacher Morgan Farraday. Her alter ego Mary Caraker is in the darkened overhead, pulling the strings and making "typewriter in the sky" noises. ■

Mary Caraker

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Ian Stewart

WALL OF DEATH

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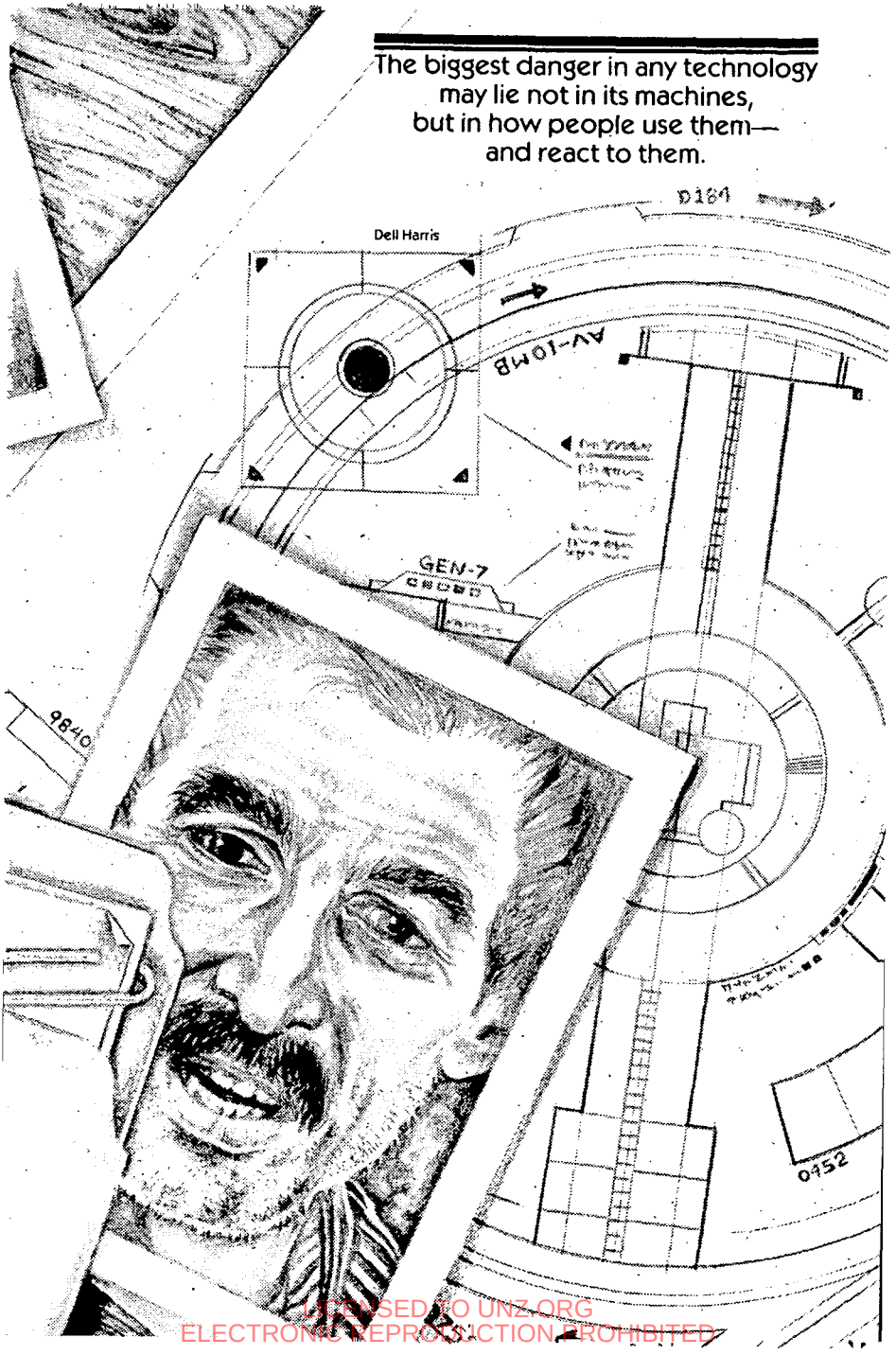
The biggest danger in any technology may lie not in its machines, but in how people use them— and react to them.



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ALTE MELLUM: 4 APRIL 1996

The mist thickened even more, and for the first time in his life the fisherman was afraid of the sea. He was getting too old for this game, wallowing about on the open sea in a skiff. He looked over the gunwale, sinewy neck bobbing like a chicken pecking for grain, hoping that the run of the current would show where he was. Between the Weser and the East Friesians—but where, exactly? The mud-flats were dangerous with the tide out; why had he let the silly woman talk him into going out in the first place?

His passenger pulled a faded anorak closer around her shoulders, tucking it under a shock of straggle-straw hair, thinking much the same thoughts. But Lisl Freisler had a very good reason for being where she was, and even though the fog had come down, she continued her work. For the fiftieth time she lowered a tiny plastic bottle into the sea on a length of string. When it had filled, she reeled it in, twisted the cap on, wiped it dry, slapped a printed label on it, and wrote down the time. She hesitated, then scribbled a query next to the heading "place." Careful, scientific work, that was what *Grüne Dämmerung* wanted. Solid, irrefutable evidence. They hadn't found any yet, but it had to be there. Green Dawn was searching for radioactive contamination, and it was more likely to show up in shallow water.

Very shallow, even for a boat with a half-meter draught. The fisherman grabbed the oars, closer to panic than he dared admit, and began to pull away into deeper water. He forced himself to think. The mud was a yellowish shade of grey. Still somewhere in the Weser estuary, then. The wind would be blowing off the coast at that time of day, probably from the southeast. If he rowed into the wind he should soon sight Bremerhaven. He felt his heart thumping, forced himself to calm down. He shivered, not only from the cold, and pulled his oilskin tighter.

A shape began to form through the the mist, at first no more than a faint outline, then darkening. It loomed ahead, huge, square, flat and featureless as a sheet of tissue paper. The edges hardened as the mist cleared.

He realized what it was, and relaxed. He was in the Hoher Weg, an area of mudflats between the island of Alte Mellum and the coast at Langwarden. Just where he was supposed to be. It was going to be OK. He laughed. OK, yes indeed. "Das OK," the Ostfriesische Kernkraftwerk, Germany's newest nuclear power station. It had been built at Langwarden two years earlier to serve the Hamburg area, despite strenuous efforts by Green Dawn to prevent it. Now they were looking for evidence to close it down again, and *she'd* hired him and his skiff to help her find it. Strange woman. Strange place. Had some funny underground track used to store electricity, it made no sense to him but that's what the papers said. He spat in the sea—he didn't much care for that nuclear stuff, he'd heard it did funny things to the lobsters. Then he felt guilty at his ingratitude: nuclear or not, it had showed him where he was.

He turned eastward, following the coast home.

* * *

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PORTOMAGGIORE: 7 JULY 1996

A thunderstorm was brewing. The basement room was cramped and smelly, tired wallpaper peeling at the corners, lingering odors of rot, burnt cooking oil, and urine. The window vibrated in its sash as the express train from Rimini to Ferrara thundered past. Despite the sticky heat, the window was closed, and not to keep out the noise of passing trains.

A half-empty bottle of chianti and an assortment of glasses had been set out on a worn table, but only one of the four people sitting round it was drinking. His name was Omer al-Nimeiry, and he had already drunk more than was wise —communing with his muse, he claimed. He held a notebook in his left hand, a pencil and a glass in his right. The others eyed him with looks ranging from distaste to pity.

Charlot Lefevre picked up a cigarette, and tried to light it. His hands shook. Maria Wagenknecht reached across and took the lighter from his nervous fingers. "Let me, Charlot. Don't want to burn the place down, do we?"

"Sorry, Maria. I'm nervous."

"You're hiding it well," Andrea Quinn said sarcastically. She pulled at the collar of her blouse, trying to get comfortable.

"I'm worried. Are you *sure* they'll give in?"

"I'm not *sure* of anything, Charlot. But I can't see any reason to worry. If everything goes according to plan, they'll *have* to agree to our demands."

"They can hardly refuse," said Wagenknecht, leaning across the table to stare into al-Nimeiry's sullen face. "All we have to do is threaten to push the—"

"It's not quite that simple, Maria!" *How can the woman be so clever and so stupid? That's the last thing Charlot needs reminding of right now.* Just because Maria had discovered him . . . Which made it impossible to shut her out. Charlot was the key, Charlot knew the secret, and Charlot needed to be handled with kid gloves in case he spooked. She could manage without the others, there were plenty more like them on the streets of Europe. Al-Nimeiry was a loser who would let himself be used because he was too tired to argue. The only problem was to stop him drinking himself to death prematurely. Wagenknecht would fight like a tigress—for a cause she barely understood—because fighting was all she knew. Quinn herself had no special talent, but she could find people, and organize them. But Charlot was different. Charlot could work miracles.

Charlot could build a bomb. A portable nuke.

And Charlot thought with his brain, not his hormones. Unlike his bombs, you never knew how he would respond to having his buttons pushed. But he was at least as dangerous.

"I don't want the bomb to explode," said Lefevre.

"We're not going to *use* it, Charlot. I don't mean we're going to bluff—the bomb has to work, and we've got to be *prepared* to use it. But it's the threat that will do the trick. Public opinion is on our side—"

"Until they hear about the bomb."

"Then they'll be scared as *well* as on our side! We're not asking the impossible, just a signature, that's all. They'll

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have to give way, they can't afford the consequences if they don't!"

"What worries me is if they sign the bloody treaty and repudiate it later," al-Nimeiry said in heavily accented but grammatical German, and refilled his glass. "I don't see why you trust them." He scribbled a few words in his notebook, sighed, and dropped it on the table in front of him.

"Omer, I don't. But the Helsingborg Treaty is backed up by international law. Once they sign, that's it."

"Even if they sign under duress?"

"Maybe not. Not in a court of law. But *this* appeal will be heard in the court of the people! They agree with our aims, even if our methods won't win any prizes. If Pölzl tried to revoke the treaty, the popular reaction would bring his government crashing down in ruins."

"Andrea's right," said Wagenknecht. "The people want an antinuclear treaty, but there isn't the momentum. It needs a push, which we provide. Once it is signed, it will stick. We may even end up folk heroes!"

Fat chance, thought Quinn. *But if you want to believe that, I'm not going to disillusion you.*

"If the plan works, perhaps," said Lefevre. "But what if it goes wrong? What if the bomb goes off? What if they find it? If they defuse it or destroy it, all our work will have been for nothing. They'll catch us! There'll be the biggest criminal manhunt the world has ever—"

"We are *not* criminals!"

"Maria, don't be stupid." *We'll be criminals to them. To ourselves, if that bomb goes off.* But not even Pölzl could be *that* foolish. . . .

"We're trying to prevent nuclear war, Andrea. A war that will—"

"Maria, I *know* what we're trying to prevent. It was my idea, right? Stop it at any price, that's what we agreed. Why go over it all again? Feel like backing out?"

"Yes," said Charlot. "But—I'm not going to. We'll pay whatever price is necessary."

"Some more than others," said al-Nimeiry. "Oh, don't look so shocked, you know why you chose me." Al-Nimeiry was a well-educated Sudanese, who had left his family behind to become a Gastarbeiter. His job was spray-painting VW trucks, but his passion was writing poetry. He also had cancer, and it wasn't responding to treatment. Like most immigrant workers he had only the minimal legal medical insurance, and his family back in Ash-Shamaliyah would shortly lose its breadwinner, which meant starvation. That qualified him for a unique role. *He even comes cheap*, Quinn thought. A few thousand D-marks would feed his family for years.

Maria reached out awkwardly and touched al-Nimeiry's shoulder, and his face brightened for a moment. "The point is," said Lefevre, ignoring or more likely not noticing the gesture, "that we don't want to go through all this for nothing. It's got to *work*. When we blow the whistle, they'll be after us. If they *find* us, we'll tell them all we know."

"I won't," said Maria. "They don't scare me."

"They should," said Charlot. "They won't play according to the rule book, Maria. Not for us." He swiveled in his

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chair to face Quinn. "I really don't see how we can hold up for long enough."

"If they catch us—and I don't see why they should, we've left nothing they can trace us by—it won't be until *after* they've signed the treaty. Nobody will dare touch us after that." She smoothed the hem of her skirt, wondering whether they would really swallow that proposition. It seemed to reassure them. *Amateurs. Why do I always have to work with amateurs?* But there were advantages . . . sacrificial lambs, all of them. *Baaa, baaa, baaa.*

"It's not getting caught that I worry about." *Oh, Charlot, you should, you really should.* "The problem is, it will ruin the whole plan."

"Charlot, *I* worry about security, right?"

"Yes." He looked uncomfortable. "But—"

"The deactivation code. Omer's role. Those are foolproof, OK?"

"I suppose."

"There's no 'suppose' about it! It's a masterstroke!" Al-Nimeiry's face made her moderate her enthusiasm. "Sorry, Omer. No offence, I'm not trying to make light of your sacrifice."

"One way, I'm dead and my family starves. The other, I'm dead and they have enough to live comfortably. I'm in it for gain, not ideology. There's no sacrifice." He threw the empty bottle into a corner and it shattered. He took another from beneath his seat, and began wrestling with a corkscrew.

"Omer's part will work, even though we all know about it. That's the beauty of the plan. And once the bomb is activated, security won't matter any more."

"We still have to conceal its exact position."

Quinn smiled to herself. It was meant to be a secret, but . . . She came to a decision. "Maria, Omer, it's best you don't hear what I'm about to say to Charlot. Leave the room. *Don't* listen at the door, right?" Maria nodded, took Omer's arm, and led him out of the room. Quinn hitched her chair over until she was facing Lefevre, her hand holding her chin as if her face were a domino at a masked ball. "Look, Charlot: only *I* know where the bomb is going to be placed. 'Need-to-know,' right? So, worst scenario: they catch *me*. What happens?"

"We're up shit creek."

"Not at all. I'm not claiming supernatural powers, but if they catch me . . . I'll talk." She leaned back smugly as the shock registered. Her lips parted, a strangely attractive lopsided smile. "I could tell them when we send the demand note! I can tell *you, now*, without the slightest risk."

Charlot began to back-track. "What about need-to-know?"

"I think you *do* need to know. Not for operational reasons, but for psychological ones. You need to be reassured. And you will see that even if they find out *exactly* where the bomb is—" she paused for dramatic effect "—that information will not be of the slightest use to them."

LANGWARDEN: 9 MARCH 1997

Erich Kappel, operations manager for the OK, rubbed futilely at a spot of grease on his shirt. He was a stocky, balding man of forty-seven; his only close relative a sister in Dresden whom

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he hadn't seen in seven years, not since Gorbachev's assassination and the border clamp-down. The OK was his life. He had fussed over it from the CAD graphics of its first conception. Now it was operational, sited between Bremerhaven and Wilhelmshaven on a bleak promontory bounded by the Jade-Busen to the west and the Weser estuary to the east. An Advanced Gas-Cooled Reactor of British manufacture, it had a design capacity of 2.5 gigawatts and actually achieved 1.8, which by the standards of the nuclear industry was close to perfection. Green Dawn hated it, whoever had built it. Most locals saw it as just a squat, ugly building, used as a landmark by the ferries from Harwich, Sylt, and Helgoland. But Erich Kappel's eyes were those of a doting parent, and he boasted about its up-to-date energy-saving technology, including a kinetic storage ring to smooth demand and improve efficiency.

He had worked for a quarter of a century as an engineer on power stations, and his reputation was enough to secure him a permanent seat on the International Commission on Nuclear Hazards. One hazard unrelated to engineering was sabotage by terrorist groups, and Kappel delegated responsibility for that to his security chief, an Australian ex-serviceman called Michael Logan.

The morning was cold, grey, and dismal. Chill winds driven by a shallow Scandinavian low gusted from the northeast, and a fine drizzle saturated the air. Despite the weather, Kappel whistled as he slammed the door of his Nissan buggy and walked across the tarmac towards the main entrance and his office. If he'd known the problem that was about to drop into his lap, the whistle would have dried up along with his mouth.

BONN: 10 MARCH

President Paul Heydrich laid the note back on his desk, next to the photograph of his grandson. He was pleased to observe that his hand was steady. "Do you take this seriously, Günter?"

"Yes, sir. Chancellor Pölzl agrees."

"He would. He'll agree to anything, the more outrageous the better." He made a wry face. "FRIEDE 2000. Just the sort of name a bunch of left-wing nuts would come up with. *I'll* give them peace—but not till a long time after the new millennium!"

Günter Berger was a career civil servant who would never dream of pointing out to his superior that the new millennium started in 2001 A.D., not 2000. Anyway, FRIEDE 2000 was well chosen, the sort of name to grab the media's attention. "I think this time the chancellor is justified, sir. There's a great deal of corroborating evidence. Indirect, of course. The note was accompanied by a plan of the device, and a description of how the plutonium had been obtained. Both are highly plausible."

"You've consulted experts."

"Our nuclear scientists believe that such a device would work. It would be clumsy, inefficient, and dirty, but it would work. I mean 'dirty' in the sense that it would spread long-lived radioactive contaminants over a wide area."

"Of course. And where do they claim the plutonium came from?"

"Stolen from the Americans, sir, and channeled by way of Iraq. Our infor-

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mation sources confirm the possibility. Probably happened about six years ago. The Iraqis didn't like Europe's renewal of economic ties with Iran after the gulf war, saw a chance to get even."

"We *were* a bit quick off the mark."

"Disgracefully quick in my opinion, sir, but I don't make policy."

"Günter, one thing bothers me. Why wasn't *I* informed of the missing plutonium?"

"The Americans told no one, sir."

"That wasn't what I asked! Dzerzhinsky Street knows the color of the First Lady's underwear before her assistant leaves the store with it! Are you saying *our* intelligence is no good? Did *Pölzl* know?"

Günter Berger had to work with both men, and he hedged. "Sir, until now we had no idea that any nuclear material was missing."

"But Günter, you just told me that sources confirm—"

"*Tend* to confirm, sir. With hindsight. The individual amounts are so small that each, on its own, might be accounted for in other, perfectly innocuous, ways. Unavoidable errors of measurement, accidental leaks—you know the excuses. Over a period of time a determined and organized group could have stolen enough to make a bomb. That's what FRIEDE 2000 claims, and the details they've provided lend that claim the ring of truth." And there was another point that had to be emphasized. "There's no doubt whatsoever that this group is well organized, sir. For a start, before this we had no inkling that it existed. And the scientists are quite impressed by the design of the bomb: whoever did it has improvised a practical, workable device."

"But there's no definite proof?" asked the president hopefully.

"What proof do you want, sir? Frankfurt in ruins? Until we find these people, or the bomb—assuming there is one—there can be no proof."

The president suddenly felt the full weight of responsibility that went with his normally symbolic office. "You're right, of course, Günter. I must assume that the bomb exists and that these lunatics will explode it unless we can stop them.

"Someone has to find them. I know who. You want to guess?" They both knew that a massive search would already be under way, authorized by Chancellor Pölzl. Neither felt it necessary to point this out.

"General Freisler, sir."

"Indeed. Herr General Eberhard Baldur Freisler. The only real choice, when you think about it. Nobody has more extensive experience of terrorism." *From both sides.*

"Get on to him at once, and bring him here. Tell him he has unlimited resources, Günter."

"Yes, sir." He turned to leave.

"Oh, and Günter?"

"Sir?"

"This is one of those occasions when preserving the letter of the law may not be as important as averting a national catastrophe. You understand? Tell Freisler to use whatever means are necessary. *Whatever.* Don't tell me, I don't want to know. We can argue violations of human rights later, *after* we've saved civilization from destruction."

Berger nodded, and closed the door.

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Heydrich flipped a switch. "Trudi? Tell Ulrich and Georg to call an emergency meeting of the inner cabinet for . . . uh . . . 1530. Inform people that they *will* attend. Get hold of Baer, arrange a helicopter and escort for Bechstein and another for Gartner." *Freisler can arrange his own transport. He'll turn his nose up at anything we offer anyway.* "Alert the armed forces, the police, and antiterrorist squads. Get representatives here, *quietly*, on the end of a telephone, but keep them away from me for the moment. Liaise with Berger on any problems. Oh, and send Chancellor Pölzl a memo detailing these arrangements."

He drew a deep breath, switched off the intercom and sank back into his chair.

He read the note again, though it was hardly necessary. The words were incised into his brain.

An atomic bomb has been hidden at a location somewhere within the Federal Republic of Germany. It will detonate at noon on Friday 14th March unless the following demands are publicly agreed to and carried out. . . .

There followed a long list, the chief demand being that Germany should sign the Helsingborg Treaty of 1991, thereby committing itself to becoming a nuclear-free zone. Meaning exactly what it said: *no* nuclear weapons on its soil, *no* nuclear power stations to be built or operated.

The signature was typed in blue ink. *FRIEDE 2000* . . . Peace 2000. He'd never heard of them. Peace? By blowing a city to bits with an atomic bomb? *Lunacy . . .*

It was ridiculous. Germany *needed* nuclear power. Weapons, well, perhaps another matter. Heydrich would have been just as happy if Britain and the US had kept their missiles off his territory. German public opinion strongly favored unilateral nuclear disarmament. Of course it did, they weren't *German* weapons. He wasn't sure in his own mind how he would feel, let alone his fellow countrymen, if the weapons had been under their sole control, but he suspected it would make quite a difference. *It's not* my *bombs I'm afraid of, it's* yours. Anyway, that stupid treaty made no distinction between peaceful commercial uses of nuclear power and military ones. They were all "nukes," tarred with the same brush. He tried to forget that FRIEDE 2000's plutonium had allegedly come from a civil reprocessing center. Damn the Swedes, sheltering under Europe's umbrella, burning imported Norwegian oil, and indulging in moral postures.

He could give into the other demands, buy time. Repudiate agreements made under duress. Unless he opened the floodgates to more moral blackmail. Dare he negotiate with terrorists? Dare he *not* negotiate? Could Germany function with half its electricity shut off? Ridiculous. On the other hand, could it function with one of its cities reduced to radioactive rubble? *Which* city? Düsseldorf? Hamburg? Frankfurt? Stuttgart? *My grandson lives in Stuttgart. . . .*

Those criminal idiots have to be stopped! There's no alternative.

But, if he failed . . . *Confound those moral defectives. This is a historic catastrophe in the making.*

* * *

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LES EYZIES: 10-12 MARCH

To Maria Wagenknecht's way of thinking, it was natural to take refuge in a tourist trap. The best place to hide is among ten thousand strangers. The locals inspect the color of your money but never look at your face, still less remember it. If they do, they confuse it with ten thousand others, and the police lose themselves in a futile search for the archetypal composite tourist.

So she told herself. But she was no longer sure she believed it. Andrea's reassuring words no longer carried conviction. She should have gotten out of Europe, even if it meant losing everything she had. But the airports were too dangerous now.

Manhunt. There was little else on the television, even the pornographic channels were interrupted by regular bulletins. The authorities had tried to keep it secret, of course, but the press couldn't be deceived for long about an operation involving every country of the western world. The hunt proceeded against a background of growing hysteria.

Every few days, she had moved. She had rented a caravan for three days, a cottage for a week. Now she was holed up in a hotel room in the most popular region of the Dordogne Valley, just as the season got under way.

The television reported worldwide protests. There were demonstrations in Vienna, counter-demonstrations in Stockholm. The German embassy in New Delhi was bombed, not very effectively. The Lufthansa office in Naples was burnt to the ground, with three dead. She told herself it wasn't her fault: she wanted peace, not violence. Mostly she felt scared, and tried to pretend she didn't. She wondered if Omer had really followed the plan all the way, and shuddered. Poor drunken dying Omer al-Nimeiry, where would we be without you? She wondered where Andrea and Charlot were, and was glad she didn't know.

She worried about Andrea's advice. *Was* France a safe place to hide? Or had the police already stumbled across a clue?

They had. By persistent, systematic detective work, which actually got them nowhere, and a stroke of luck, which they imagined to be the result of persistent, systematic detective work. It took just thirty-six hours to pick up the trail.

FRIEDE 2000's demand note had been produced on a daisy wheel printer attached to a widely available Apple-compatible word processor of Korean manufacture—but using an unusual blue film-ribbon. The alignment of letters indicated that the printer was about six years old, but the clarity of the image would be expected only if the printing element was brand new. The manufacturer's European service records, assembled from seventy-nine different branches in eleven countries, produced a list of some 1,500 possible users; independent suppliers added a further 350 names. Cross-checked against other lines of enquiry, these left a residue of seven prime suspects. By then, five had already been rounded up, along with 3,000 other suspected or known subversives. Of the missing two, one was arrested in Hamburg at the docks; the other was picked up while visiting her mother in a Copenhagen hospital.

Five hours of interrogation produced

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a list of half a dozen probable members of FRIEDE 2000, two of whom were already in custody. It was totally wrong. The movement was a figment of Quinn's inventive imagination: the only "members" were herself, al-Nimeiry, Wagenknecht, and Lefevre. But while the French police were establishing by painful and illegal means that these two unfortunates knew absolutely nothing, an eighth suspect was added to the list. The name of Maria Wagenknecht popped out of an Interpol computer search for common contacts among the suspected—and totally fictitious —membership. People with common interests and backgrounds tend to buy the same word processors.

Luck. And very bad luck indeed for Maria Wagenknecht, because after the shaky start it was superb professionalism all the way. They caught up with her at three o'clock in the morning in her hotel room at Les Eyzies.

BONN: 12 MARCH

President Heydrich was feeling unduly pleased with himself. Wagenknecht had talked—after a surprisingly long delay. He thought about asking Günter Berger whether the interrogators had been too light-handed, but doubted it, and had no wish to be associated with the messy realities. She had revealed the names of al-Nimeiry, Quinn, and Lefevre, and had died convincing them she knew nothing more.

The next information was negative. Andrea Quinn didn't exist. A woman answering her description had flown to Paraguay three days before the demand note had been received. Unlike her collaborators, Quinn knew when to cut her losses and get out. She had planned to do so all along. Encouraging the others to stay put just made a marginal improvement to the odds—but Quinn liked to play the margins.

Then came the breakthrough. Charlot Lefevre was picked up in Cagliari by the Sardinian caribinieri. He held up for a much shorter time than Wagenknecht, and then he told them where the bomb was. He told them everything he could think of, most of it irrelevant. They got interested again when he began screaming something about a deactivation code.

Somewhere in the world there was a FRIEDE 2000 recruit who knew the coded signal that, transmitted by radio, would disarm the bomb. Call him X, trite but convenient. On receiving proof that Germany had signed the Helsingborg Treaty, removed all nuclear missiles from its territory, and shut down its nuclear power plants, X would deposit the code in a safe place and telephone the authorities to tell them where it was, and how to transmit it to shut down the bomb.

Who was X? Lefevre said he didn't know, that *nobody* could know. He explained in great detail exactly *why* nobody could know. The torture continued, long after his interrogators had become convinced he was telling the truth. They didn't know what else to do. But the story made sense. Among other things, it explained why they'd had no luck at all in picking up Omer al-Nimeiry.

Only al-Nimeiry knew who X was, for it was al-Nimeiry's job to recruit him. Or her. After that he would choose and program the deactivation code, telling only X.

Then al-Nimeiry had a final task: to

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kill himself. He had cancer, he had been willing to commit suicide in return for money for his wife and child. The trail to X would die with al-Nimeiry.

Unimpressed, the police set about tracing al-Nimeiry and his contacts. He might still be alive; it might be possible to deduce X's identity. But they doubted it would be necessary. They now knew exactly where the bomb was; they even had Lefevre's design plans. Destroying it would be a piece of cake. FRIEDE 2000 was a dead duck.

The press were given a brief announcement that the location was known, no details. A disposal squad was said to be on the way to render the bomb harmless.

It was all pretty much wrapped up.

LANGWARDEN: 12 MARCH

In computer simulation the coolant valves seemed to be operating perfectly, but Erich Kappel was unimpressed. "Try closing them in pairs, leaving the rest open. Look for resonant vibrations in the pipework. When you've checked that out, try them in threes. Then maybe I'll be—" His pager bleeped, and he pulled it out of his overalls to look at the tiny screen. He was wanted at the nearest secure telephone.

As he listened to what Berger had to say, he became less and less happy.

". . . fortunately we've captured the ringleaders. Realistically, there's no hope of getting hold of the deactivation code, but that shouldn't matter. A bomb disposal squad is on the way to you by helicopter, it should arrive in about twenty minutes. That leaves just under forty-five hours to disable the bomb. Child's play."

It all seemed unreal. An atomic bomb in the OK? They needn't worry about it being dirty: if the plant blew, they'd find out what dirty fallout really was. Plutonium particles, radioactive cesium, iodine, all kinds of exotic isotopes. Depending on the wind direction it could come down anywhere in Europe. Maybe everywhere. "Where *precisely* have these people dumped their doomsday machine, Günter?" *How in God's name did they ever get it past Logan's men? He'll blow his—*

"In the kinetic storage ring, somewhere on the storage vehicle," said Berger. "I'm phoning to ask you to stop the thing moving, so that the squad can get to work. . . ." Kappel no longer heard the droning voice. *The storage vehicle!*

One of the biggest problems in operating a nuclear power station is to keep the load level. Demand for electricity has daily, weekly, and seasonal cycles. In the morning, people run electric shower heaters, boil kettles to make coffee. They turn on heaters in the winter, and air-conditioning in the summer. Christmas morning is Turkey Armageddon.

Not a bad description of the mess we're in, when you think about it.

To keep things smooth you have to channel off spare capacity when demand is low, and boost output when demand peaks. In the 1980s the favored method was pumped storage. Use spare power to raise water to a higher level; run it back down through turbines when you wanted the power back. It wasted a lot of energy, but less than the alternatives.

By the 1990s pumped storage was obsolete. The in thing was the KSR

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—kinetic storage ring. A massive vehicle ran round a circular underground track, like a wall-of-death motorcyclist, and spare power was fed through electric motors to speed it up. To get the power back, the system went into reverse, the motors becoming generators. Electrical energy was traded for kinetic, back and forth as needed. The technology was borrowed from high-speed trains; the Japanese had a natural edge.

The Ostfriesische Kernkraftwerk had Europe's biggest storage ring, with a capacity approaching ten gigawatt-hours. A truly massive vehicle circled a five-kilometer track at speeds of up to 800 kph. A crash at that speed would wreak all kinds of havoc, so the engineers designed for a speed twice as great.

To reduce friction, it traveled in a vacuum.

The storage vehicle! Kappel's heart sank. He interrupted the flow of optimism. "Günter—it's not going to be as easy as you think."

BONN: 13 MARCH

Heydrich's emergency meeting of the cabinet took place not in the Bundeshaus, but in a small block of nondescript buildings on the nearby Adenauerallee, next door to the art museum, Heydrich's abiding passion. It calmed his nerves to look out the window, across the park, and see the strong clean lines of the Akademisches Kunstmuseum. So many great works of art. It offered a degree of permanence that was usually lacking in politics. And today of all days he needed to be calm.

The meeting wasn't going well.

General Freisler was unusually subdued; he seemed to have something on his mind. The most famous soldier in the Bundeswehr didn't *look* like a general. He was short, slight of frame, and still had all his hair. Today he wore a business suit rather than a uniform. It couldn't have been to deceive anyone who might be watching, because his face and figure was instantly recognizable; maybe it was just his carefully cultivated habit of being unpredictable.

The chancellor was quite the opposite. "Ridiculous!" said Pölzl, looking as if he was about to strangle somebody. "There must be *some* way to get in! Why not break down the doors!"

Kappel, flown in by private plane and helicopter, sighed inside. *Here we go again.* "Chancellor, I regret that those are no ordinary doors. They are designed to prevent access while the vehicle is in motion. That includes *authorized* access as well as unauthorized. The tunnel is *sealed.* There's no way in until the vehicle stops. None."

"Stupid! Why employ such a silly design?"

"Safety regulations imposed by your administration, sir."

Pölzl blinked. "I beg your pardon?"

"When the design for KSRs was being approved, there was a lot of worry about the dangers of a crash. If the vehicle fails, an awful lot of energy is released very fast. It's like a substantial explosion. The regulations insist on a foolproof system of interlocks. The vacuum, for example, cannot be broken *in any manner* until the vehicle is stationary. Neither can the doors be opened."

"But surely—"

"The regulations are quite explicit, sir. Ironically, they were written that way to make life difficult for hypothet-

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ical terrorists who might attempt to damage the facility."

"Pah!" said Pölzl, going red in the face. Heydrich hid his smile behind a sheaf of papers.

"Of course, that wouldn't matter if we could stop the vehicle by Friday. We can't."

"No brakes?" said Pölzl, with heavy irony.

"In a manner of speaking. The vehicle is *designed* to operate with minimal energy loss. Withdrawing energy at the highest rate, it takes roughly one hundred hours to run it down from its normal operational speed of 800 kilometers per hour. You see, it has a kinetic energy of—"

A red light blinked. Heydrich picked up the phone, listened briefly, nodded. "I regret to inform you all that Omer al-Nimeiry's body has been found, floating in a blood-filled bath in Düsseldorf. He slit his wrists with a modeling-knife."

"Damn," said Freisler, who had been sitting back in his chair, gazing out of the window, and grappling with an insoluble dilemma. Ordinarily he would not let personal problems distract him, but there was nothing ordinary about the position in which he now found himself. "We're on our own, then. Is there any way to slow the vehicle down faster? Let some air in? Friction could have quite an effect, I'd imagine."

"No, General. The interlock prevents it."

"And you can't use explosives in case they trigger the fuse."

"Exactly."

"So you're slowing it down as fast as you can, in the hope something will turn up."

"No, General. The advisors decided against that."

"Hmmph. I suppose they know what they're doing."

"But surely—" began the secretary of state for foreign affairs, who would greatly have preferred being anywhere other than that room, even if it was sitting on top of the OK. He coughed and started again. "I am under extreme pressure from several dozen governments. They're worried about nuclear fallout, they're worried that other groups may be encouraged to try the same trick. Can we not bore a shaft, drop some dynamite down it, and blow the thing off its tracks? At that speed, it will surely wreck the device!"

"I regret that the tunnel, like the rest of the installation, is hardened against nuclear attack. It would take a week to bore a hole."

"But surely that means we need not worry!" said Pölzl. "If the tunnel is as tough as that, it will contain the blast!"

Kappel and Freisler both shook their heads. "Rubbish," said the General. "Nothing comes *that* hard, not to a direct hit. You'll get a bloody great hole and a lot of very dirty amateur-bomb fallout."

Walter Bechstein, defence minister, was generally held to be one of the more astute members of the cabinet, if not of the entire Christian Democrat Alliance. He said, "Is there *no* communication with the tunnel, or the vehicle, while it's moving?"

"Two channels only," said Kappel. "A radio link for certain remote controlled equipment—which we presume

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is what the terrorists expect us to use to deactivate the bomb—and a pumping system to keep the tunnel evacuated."

"Ah! Could we reverse it to let air into the tunnel and slow the vehicle down?"

"Yes, but it's a low-capacity system. The vehicle would stop soon after 1600 on Friday."

"By which time the OK would be a four-hour-old mushroom cloud. Damn! What about pouring water in through the pipes?"

"It would collect in the bottom of the ring. It's five kilometers in circumference, you could never pump it in fast enough. They're small-bore pipes, just to keep the vacuum good. The main vacuum system is, of course, interlocked. It's a fail-safe system."

"When a fail-safe system fails," murmured Berger, "it fails by not failing safe."

"What was that, Günter?"

"Nothing helpful, sir. Sorry."

"Acid?" asked Freisler. "Gases to corrode the metal of the vehicle? Or the bomb?"

"The vehicle is designed against enormous stresses. The alloys we use happen to be acid-resistant. They weren't designed that way, but it's not surprising: resistance to stress tends to correlate with resistance to corrosion. The bomb will be inside the vehicle's casing. No joy there."

There was an awkward silence as the reality sunk in. More high-powered brains enforced a strict code of security, but to hell with it. For once he'd—

"Sod it," said Pölzl, "we can't just do *nothing!*"

"We are doing *one* thing," said Kappel.

"What?"

"We're speeding the vehicle up."

HAMBURG: 13 MARCH

Lisl Freisler bent over the sink, rinsing her hair with hot water scooped from the basin in a toothmug. Her head ached and she felt terrible. It had been a *great* party—until she'd got home.

The phone rang.

She swore and wrapped a towel round her dripping hair, then picked her way through the debris of her bedroom, pushing aside a pile of dirty underwear and a makeup bag to reach the phone.

"Lisl Freisler."

"Lisl, please *don't* hang up!" She recognized the voice at one. "This is important!"

"Nothing you can say to me is important, Father."

"Your life may depend on it. *Listen!*" So dramatic. So unlike her oh-so-cool parent. Odd.

"OK, I'm listening, you're talking. So what's new?"

"You've got to get out of Hamburg at once! Don't stop to pack, just grab a few things and get in the car. Go to the villa in Pfaffenhofen. I'll call you again there."

"The car's buggered."

"Take a taxi. I'll pay.

"A *taxi?* It's *eight hundred kilometers!*"

"Money doesn't matter."

Lisl laughed bitterly. "That's because you've got too much. To *my* kind of people, money matters a lot. But they never get any because bastards like you take it all away—"

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"For God's sake, Lisl! Save the leftist lecture for later! If you want to stay alive, *get out of Hamburg!*"

"I'm not budging a centimeter until you tell me why."

General Freisler clenched his fists in irritation. "Lisl, it's classified information, I can't—"

"Then I don't move."

He sighed. *How did I ever produce such an obstinate little bitch?* But he knew the answers to that, all of them. How had he ever expected to produce anything else? "All right, Lisl, but you must swear not to tell anyone else. Not a soul. *Especially* not anyone from Green Dawn."

"Not even Martin?"

She wouldn't come without Martin. "Tell Martin. *Bring* Martin. But make sure it goes no further. Promise?"

She could hear the urgency in his voice. High-and-mighty General Freisler was *scared!* That was unprecedented. It didn't occur to Lisl that her father was frightened for her. It also didn't occur to her to lie: to Lisl, a promise was sacred, and her father knew it. "If you insist," she said reluctantly. "I promise."

"A bunch of loonies have planted an atom bomb. They're going to set it off unless Germany signs the Helsingborg Treaty!"

"About time. Good for them. Where can I join?"

"They'll kill millions! They're mad!"

"No madder than you. You've got thousands of nuclear missiles aimed at Russia. How many will *those* kill? And how many of us will die when the Russians send theirs in return? The nuthouse is as crowded as a Turkish worker's hostel in Berlin, Daddy dear! Me, I'm on the side of the angels."

"Don't give me that Green Dawn nonsense. These people are terrorists."

"It takes one to recognize one."

"I'm not going to argue my war record with you now. Anyway, you'll *be* an angel if you don't get out. The bomb is in the OK. That makes it even more dangerous, and you're right in the—"

She knew what he'd say next. As a member of Green Dawn she knew all the weaknesses of the OK, knew the design like her own backyard. She knew what effect a nuclear bomb would have. She giggled. *Bombfight at the OK corral.* But it wasn't funny. The OK was less than a hundred kilometers away. She sensed her own rising hysteria. "There will be a public evacuation announcement shortly. But to be safe, you *must* get out *immediately!*"

She drew a deep breath. *The trouble with father is that he thinks he can give orders to everyone.* "Yes, *sah!* No, sir, three bags full, sir. Now, *you* listen to *me!*"

"But—"

"I said, *listen!* Maybe if you'd done that a bit more—oh, hell, just listen, damn you! I'll get out. I'll use my privileged position as the daughter of Germany's famous military figurehead to save my cute little ass, along with the even cuter one of my current lover. *But* . . . I can't reach Martin until midnight, he's away. I'll get out in my own good time, on my own two feet, in my own way, and to my own agenda. Got that?"

You're cutting it terribly fine, you stupid . . . No, don't say it, or she'll hang up. "As you wish. I've done all

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I can, it's your life. But don't waste any time. Once the news gets out, the roads and railways will be jammed *solid*. And Lisi?"

"Yes, Herr General?"

"I love you. Badly, in my own way. But until now I always found it hard to say so." He hung up.

Damn. There were tears in her eyes. *The bastard knows how to push your buttons, child. All part of the act.* But if he was such a bastard, why had he bothered to warn her? And if she really thought he was, why couldn't she stop crying?

BONN: 13 MARCH

"*Speed it up?* Are you mad?" Pölzl almost yelled. "That will just make the problem *worse!*"

Kappel had to shout to be heard. "Chancellor—gentlemen, please hear me out!" The noise subsided. "Thank you. The idea is to precipitate a mechanical failure by exceeding the design velocity of the vehicle."

"You mean it'll crash if it goes fast enough."

"Right. And the crash will wreck the bomb."

"How can you be sure of that?"

"Remember, we have Lefevre's designs, they were included with the demand note to convince us the threat was genuine. It takes very precise engineering to make an atom bomb explode. Even slight faults in the detonation system turn it into a dud. *Damage* the system—well, the chance of the bomb exploding is very small."

"*How* small?"

"Five to ten percent," said Kappel apologetically. He waited for the protests to die down. "There's no choice, gentlemen."

"If that's the risk, we'll have to accept it," said Heydrich. "But what's the chance of the vehicle crashing?"

"Touch and go. Depends on whether we can feed in enough juice to get the speed high enough. Mashita's people reckon it will need to reach 1,800 kph." He gave a wry look. "I'm an engineer, and even I find that mind-boggling. However, they insist there's a ninety percent chance it will survive up to 1,600 kph. The chances fall off sharply after that. We're channeling as much of the OK's output as the cables will stand directly to the vehicle."

There was a dispirited silence.

Heydrich broke it. "Thank you, Herr Kappel. It is best that you return to your advisory team at once. We will stay in close contact."

After Kappel had gone, he took a deep breath. "Gentlemen: we will get nowhere trying to second-guess our scientific team. We must consider the alternative."

"What alternative?"

"A political solution."

For a second nobody spoke; then the meaning penetrated and they all tried to talk at once. Heydrich called for order; eventually Freisler shouted loudly enough to be heard above the clamor.

"Give in to this disgraceful blackmail? *Never!* I didn't spend three years running agents behind the Syrian lines just to—"

"Easy to say, General," said the energy secretary. "But if we can't destroy the bomb, and we don't accede to their demands, we will lose Bremerhaven, Wilhelmshaven, Oldenburg, Bremen,

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and conceivably Hamburg, too. If the wind turns and comes from the west, the fallout could carry as far as Berlin. The DDR would not be pleased."

"They're not pleased now," said Pölzl. "We're under enormous pressure—I mean, *enormous*—from Russia, the DDR, Poland, Hungary, Czechoslovakia, and the Baltic Union. They haven't offered any useful advice, but they want a solution. Fast."

"How's the evacuation going?" asked Freisler, ignoring him.

"Badly," said Günter. "With only thirty hours to go, there's chaos. The E3, E71, and E4 are clogged with traffic. Cars have broken down, mostly because they're trying to carry too much stuff. The cities are in a state of panic."

I'm glad I told Lisl to get away early, Freisler thought. *Rank hath its privileges* . . . "There's a heavy police cordon around the OK."

"You think people will try to get *near* the thing?"

"I guarantee it," said Freisler. "Most of them will run the other way like scalded cats, but some will head right in where angels fear to tread. Probably think they can dismantle the bomb with their bare hands."

"They must wonder why it wasn't defused days ago. You must admit we haven't given them any hard information."

"I don't dare," said Pölzl. "If I did, there'd be *real* panic. And all the crackpot greenies and lefties will be prancing around shouting 'I told you so!' soon enough as it is. I certainly don't want to encourage them."

"They *did* tell us so," said Bechstein. "Repeatedly. Maybe we should have listened."

"Whose side are *you* on?"

"Humanity's, I hope."

"Why didn't you start the evacuation sooner?" asked Freisler, returning to the subject before the chancellor throttled the defence minister.

It isn't like pressing a light switch. . . . "At first we had no idea where the bomb was," said Heydrich, finding himself in the unusual position of defending the chancellor's actions *and* believing what he was saying. "Once we found out, we thought the bomb could be made safe, and we didn't want to start a scare. Evacuation can do more harm than good, we wanted to be sure it was really necessary. By the time we realized that the chance of defusing the bomb was remote, we were running out of time. We've moved very fast since. I'm not sure if we can move fast enough to prevent a tragedy, though."

"Sign the blasted treaty, then!" yelled Pölzl. "When the bomb's made safe, revoke it again! Cheat the bastards!"

"My thoughts entirely, Herr Chancellor," said Heydrich. "Of course, it will mean the end of your administration."

"Nonsense!"

Heydrich stood up, leaning against the edge of the table. "I wish it were. But the majority of the German people do not want nuclear weapons. They don't really want nuclear power—it scares them."

"It scares me," said Bechstein.

"They expect miracles, electrical power from thin air. . . . But they want a nuclear-free Germany. If I held a ref-

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erendum today, I'd be signing the Helsingborg Treaty tomorrow.

"Be that as it may, I believe that signing the treaty is our only way forward. And to get the bomb deactivated we must also remove all missiles and shut down all nuclear installations. But we can turn the element of coercion to our advantage. We don't have to keep the power stations shut down once the bomb is deactivated. We can plead for time to make the transition. Write some extra paragraphs into the treaty. Renegotiate, ratify."

"Fudge it," said Freisler. "Like we always do."

"Exactly. Gentlemen, do I have your—" He was interrupted by an aide, who looked apologetic but determined. There was a whispered conversation and a letter changed hands. Heydrich picked it up, read the signature. Omer al-Nimeiry.

Posted just before his suicide.

Heydrich read it through, and felt his back crawl. It was . . . was it a *poem?* It was written in a very strange style. The second verse—if it *was* a verse—was typical.

Cheated by life, I inhabit a foul mocking shell. I do not choose to suffer pitied and despised. They bend my ruined body to their aims. Fools! I bend their aims, I steal their weapon, I die by my own hand but not alone. Millions will join me. Millions whose bright lives taunt my spirit. Millions with the spark of life, while I . . . so much to offer, yet so soon snuffed out. . . .

Weird. Did al-Nimeiry think the bomb was going to go off regardless?

Yes, he did. With good reason.

The final "verse" explained why. Heydrich let the letter slip from his fingers as the blood drained from his face. He glanced at the clock, which read 1743, but scarcely registered that less than nineteen hours remained. The silence up and down the long table was tangible and frigid, like pack ice.

"Gentlemen," he began, and faltered. *How am I to tell them that one pitiful, sick, embittered man who thinks he is a poet has . . .* good God, his poem oozes sentimentality and self-pity, flowery phrases, he can't even write—oh, hell, this isn't the time for literary criticism . . . Heydrich gathered his wits. "I have terrible news. The decision is not ours to take.

"Omer al-Nimeiry had his own hidden agenda. He double-crossed his co-conspirators.

"There is no 'X.' There is no deactivation code."

HAMBURG: 14 MARCH, 0500 HR.

Disaster brings out the capitalist in us all. Damn it. She shook the flashlight to bring it back to life again and swore at the suitcases, piled up beside Martin's beat-up Audi. *Don't let anyone know. I'm doing my best, Daddy dear!*

"Guten Morgen, Lisl."

She jumped. At that unearthly hour they should have been able to load unobserved in the disused builder's yard behind the apartment block. It was Frau Neumann, of course. "Nase Neumann" they called her. Neumann the nose. Must have seen the light flashing. After that a herd of rogue elephants wouldn't be able to keep her away.

"Going on a picnic, Lisl?"

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"Not quite, Frau Neumann. We've decided to take a holiday in Bavaria."

"Wonderful! I *love* München in the spring!" She peered in the rear window. "Though March is a little soon, isn't it? And such an early start, you young people have so much energy! Taking your paintings on holiday, too, I see." She said this as if it was accepted practice, but Neumann the Nose missed nothing. Lisl silently cursed Martin for insisting on bringing the blasted things, but there was no point arguing with an artist about the value of his work.

"Martin doesn't like to leave his works unattended in the house for such a long period. We're dropping them off at the bank vault on the way." *Idiot, it's five o'clock in the morning!* "We're stopping by Martin's mother's house in Hannover, for breakfast. It's their bank's vault."

"Ah. You're taking a lot of luggage, Lisl. *Seven* suitcases."

Lisl felt a flush creeping up around her collar. "Yes, Martin likes us to be well equipped."

"So I see." Lisl had been managing, until the Nose arrived. *That woman can smell trouble a kilometer away. It will be all over the neighborhood in ten minutes, the street will be jammed in eleven.*

There was only one way out.

She pulled Neumann the Nose to one side. "If you want to know what's *really* going on, I'll tell you, and you get to come, too. I'll give you ten minutes to grab one small suitcase. But don't tell anyone else, or none of us will get away!"

"Oh my," said Nase Neumann. *Pay dirt!* "You mean it's not a holiday after all?"

LANGWARDEN: 14 MARCH, 0530 HR.

A hundred feet below ground the tunnel ran in a perfect circle, five kilometers round, clad in impenetrable steel and concrete to guard against seepage, subsidence, and outside attack. The massive storage vehicle hurtled ever faster round this wall of death, a flywheel turned inside out and constructed on a superhuman scale. At 1,400 kph it lapped one circuit every twelve seconds. At that speed, it might run for weeks without a breakdown. But if they could get the interval down to nine seconds . . . then, perhaps, centrifugal forces might fracture the suspension.

A vehicle built for a longer track might have been less massively engineered—for the greater the radius, the lower the forces—but tunneling costs money. Mass, materials, track radius—all factors had been balanced to an economic optimum.

The vehicle's progress was monitored on a direct radio link by a team of experts, located in Emden. Far enough away to avoid the worst effects of an explosion, but close enough to be reached quickly. But there had to be a small group in the OK itself, to work the controls and monitor the instruments. There was also a squad of soldiers, armed with Uzi submachine guns; and outside the plant there were several hundred more. Two technicians had volunteered to stay to help man the switches. Michael Logan insisted on staying with them. He felt responsible for the security failures that had allowed the bomb to be planted. He should have protested when the gov-

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ernment contracted "routine" work to a private security firm. It had never really occurred to them that anyone would try to infiltrate something into the storage ring. He knew they'd be sloppy, making a profit by cutting corners. Of course, even if he *had* protested, nobody would have listened, but Logan found little comfort in that. Anyway, Logan had a second reason for volunteering. Afterwards, when heads rolled, his would be the first on the block. It was the only way to salvage his career.

Finally—against all advice—there was Erich Kappel, who argued that he couldn't ask anyone to do something he was too scared to do himself.

By 6:00 Friday morning, with a bare six hours remaining, the two technicians left, no longer needed. There were no more switches to man: all they had to do was wait. In the pitch-black vacuum of the storage ring a new land speed record was being set on every ten-second circuit, the velocity building in infinitesimal increments towards the magic 1,800 kph. It was now close to 1,600 kph with no sign of anything breaking down. Kappel crossed his fingers and prayed that the first failure wouldn't be an electrical fault. If a motor blew, they'd never get the vehicle up to destruction speed.

BILLSTEDT: 14 MARCH, 0624 HR.

Lisl jumped down from the Audi's roof. "It's no good, Martin, the road's jammed from here to the horizon. Nothing's moving. We'll just have to wait." *First stupid bloody Neumann wastes time, and then the stupid bloody car gets a flat! We haven't even got outside the Hamburg suburbs!*

"Or walk. Which way's the wind blowing?"

She wetted a finger, held it aloft. "From the west. We'll cop most of the fallout if it goes off."

"Maybe the wind will change. There's still nearly six hours to go."

"Fat chance. We *told* the idiots not to build the bloody thing right on top of a major urban area!" She kicked at the tire in disgust. She heard a burst of static, then an announcer's booming voice. Neumann the Nose had switched on the car radio again. A total waste of time, there was nothing worth hearing. A great deal of speculation by newsreaders who didn't known anything and tried to pretend they did, interrupted by regular official announcements that explained that the vehicle was being speeded up, to cause it to fail, and that the destruction of the bomb was going according to plan.

"Bullshit!" said Lisl. "If it was going according to plan, the plan would have worked by now!"

"I guess."

"Damn it, Martin, *something* has to give way! The KSV wasn't designed to take that sort of speed. Stupid idiots, getting the Japanese to build it! If they'd let the Brits build it, like the main power plant, it would have fallen apart in a dozen directions by now! Jesus! To think it's come to this, just on account of some stupid tin pot underground resistance movement! What a stupid waste of—"

Underground.

Resistance.

Movement.

Martin's jaw dropped open as Lisl

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began to run back towards Hamburg, dodging between the cars.

HAMBURG: 14 MARCH, 0745 HR.

The phone lines were jammed. The crowd outside the police station was twenty meters deep and growing. She couldn't work her way through it, and even if she had, would anybody listen? *I think I know how to destroy the bomb. Yes dear, just have a nice lie down until the ambulance arrives.*

Great. First time in my life I really need to talk to my father, and there's no way to get to him.

Lisl looked at her watch. Four and a quarter hours to doomsday. Time was running out, and she was running out of ideas. She pushed her way against the flow of pedestrians, but it was too strong. She was spun round, and flushed down the street on a human tide. She fought her way to the edge of the road and ducked down a side street. For want of anything else to do she wandered along it, swearing under her breath.

There was some sort of fuss up ahead. A large van, being loaded with equipment. Television cameras, by the look of it. The side of the van bore the letters FSH. So did the building opposite.

Fernsehen Hamburg. Hamburg Television!

An idea began to form. It was outrageous, but she couldn't think of anything else.

The front door was out of the question. She found an alleyway down the side of the building and began to look for a way in.

BONN: 14 MARCH, 0930 HR.

Günter Berger had a telephone in each hand, a dozen more within arm's length. Six television sets were ranged against one wall, with the sound turned down. A bank of switches operated them from his desk. He was talking urgently to the chief of police in Lübeck. There was a riot at the quay for the Karlskrona ferry, at least six drowned. He noted the incident on a pad, already three-quarters full. From the corner of his eye he saw that channel 11 was starting the Fernsehen Hamburg news. The riot would no doubt be on that. What a way to run a crisis!

He was about to turn his head away, when the newsreader was thrust rudely aside and a disheveled, breathless young woman started shouting at the camera. She was cut off in mid-sentence and the screen went blank for a few seconds. The regular newsreader was back, red in the face, and if he'd had the sound on he'd have heard her stumbling over the words on the autocue.

But recognition was stirring in Berger's brain. *I know that face . . . who is it?*

My god, it's Freisler's daughter. What the hell is she up to?

He rewound the VCR and played back the recording with the sound turned on. He played it once more, to make certain he'd heard correctly. Then he reached for a phone and punched the button for General Freisler, while on a second phone he instructed his secretary to get on the line to the head of programming at FSH, top priority.

LANGWARDEN: 14 MARCH, 0940 HR.

Even through the thick walls, Kappel and Logan could hear the crowd yelling. It was an angry, ugly sound. The troops'

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commanding officer was trying to talk to them over a loud-hailer. It wasn't clear what effect, if any, he was having.

"They're crazy! There's a bomb about to go off beneath their feet, and they're trying to get closer! What the hell do they want?"

"They want to pull this building down with their bare hands, Erich."

"Over my dead body."

"That's probably what they're after. *You* made the OK possible. You're identified with it."

Erich checked the data read-out again. "Damn it all, Michael, it's still stuck! It's been at 1,871 kph for twenty minutes now!"

"I know."

"The motors can't turn any faster."

"No. If they burn out, we've had it. It's not going to work, Erich."

"There's still time. It can't take this speed much longer. A pressure-bearing will collapse, or a shock-strut will fracture. . . . *Something* has to give soon, it's way over design speed. Hell, how do we know the bomb will go off anyway? Maybe there isn't a bomb; we've not *seen* it. It could all be a bluff—"

"Yeah. And maybe the vehicle will crash into Santa Claus's sleigh." The clock moved silently on to 9:45. The front end of the vehicle was showing signs of vibration, but at the wrong frequency to do any damage. Those blasted Japanese engineers with their too-clever computer models! They'd designed the resonances out.

The phone rang. Kappel picked it up.

"Hello? Yes, General." He drew silent, his finger tapping distractedly against the table. "Hmmm. How did she—no, there's no time for chat. It could work. We'll give it a whirl, nobody else has any ideas." Even at this stage he found it hard to believe that he would soon be sitting at ground zero of a nuclear explosion, and he was calmer than he'd expected. He had an idea it wouldn't last.

"Michael? Freisler's daughter's came up with a crazy idea that *might* just work! Let me see, we've got plenty of heavy cable. . . . His voice trailed away, as he became lost in private calculations. "It needs manpower, though. . . . Tell the major to pull twenty of his troops out of the line and put them under my orders!"

"He won't like it, Erich. They're under a lot of pressure out there as it is."

"We're under even more pressure here. Tell him to ask for reinforcements. If we're going to save this baby, I need those troops!"

LANGWARDEN: 14 MARCH, 1120 HR.

Black leather motorcycle jackets jostled against tracksuits and old raincoats. The crowd was a random brew, malcontents and drifters, students, political activists, troublemakers, teenagers, even an old man wearing a long grey beard and a matching suit. The troops, hastily assembled from local garrisons, were mostly young and mostly inexperienced. They held their submachine guns awkwardly. The major in charge knew he needed reinforcements, it was difficult to control six kilometers of perimeter fencing. The top brass had screwed up, as usual.

His radio bleeped. "They've brought up bolt-cutters in sector 5, sir!" He thumbed the switch to *send*. "Verbal

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warning. Give them twenty seconds, then shoot whoever's holding the cutters. If anyone picks them up, shoot them too."

"Yes, sir. Er—when do we stop shooting, sir?"

"When nobody picks the cutters up. Out." *Damn fool question. But will they fire on unarmed civilians, just because they're ordered to? More to the point, will they stop firing again? They're scared, I can smell it.*

The crowd swayed, and parted. A heavy truck shot through the gap, heading straight at the fence. The turret of the nearest tank began to swivel, but before the artilleryman could train his gun, truck and fence collided in a tangle of torn metal. The shell missed the truck and demolished a stand of trees half a mile away. Screaming people scrambled through the gap, brandishing sticks, bricks, even a bucket.

An armored car started up with a light machine gun. The quality of the screams changed, from anger to anguish. Bodies fell and writhed. But more came through the gap, a human wave. Before the major could deploy additional troops to stem the tide, others broke through the fence in two more places, then three, all widely spaced.

I was briefed to respond to a disorganized riot. But some bastard's coordinating this.

He raised his gun, and a rifle bullet blew the back of his head off.

Inside the control room, Kappel and Logan heard the gunfire. The screams got louder, closer; the building shook to the explosions of artillery shells. Logan thumbed his Uzi to single-shot, and picked up a microphone connected to the station's PA system.

Kappel was in radio communication with the troops laying cables to the storage ring. He shouted to Logan: "Two minutes, they'll be ready!"

Plenty of time, thought Logan. *We've got ten till the bomb goes off.* Kappel's hand hovered over the master-switch. The noise of the crowd grew louder still. Then the door fell in as a small group battered it down.

Logan fired three shots, half a second apart, just centimeters over their heads. They froze, suddenly silent, realizing how few they were. "Anyone who moves gets a bullet!" Logan shouted into the microphone. His voice boomed round the almost empty building. The people at the front shuffled nervously.

From behind, somebody tossed a grenade, probably snatched from a dead soldier. It sailed over their heads, and rolled under a bank of switchgear. "Down!" yelled Logan, ducking behind a bench, pulling Kappel to the ground. The grenade exploded.

As the dust cleared, Kappel scrambled to his feet. *They were wrecking his beloved OK!* "No!" Before Logan could stop him, Kappel charged blindly towards the crowd. A shotgun blast caught him in the chest, slamming him to the floor in a shower of blood.

Logan peered cautiously round the end of the bench. "You!" he screamed into the microphone, picking somebody at random. "You with the green jacket! You're dead!" The Uzi crashed and the man's head dissolved. Logan pointed to the woman next to him, improbably clad in a pink sweatshirt and holding a table-leg. "You're next!" Again a sin-

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gle shot from the Uzi, a dead body on the floor. The crowd shuffled nervously. A mass riot was one thing, but this war was getting kind of personal. They didn't like that. "Front row, brown leather jacket!" Brown leather jacket turned to run, and the bullet caught him in the back. Before Logan could name his next victim, they fled in panic, fighting each other to scramble through the smashed doorway. Logan was left, lone victor in the field.

He picked up the radio, coolly confirmed that the cables were connected, walked a few paces, and threw the master-switch. He glanced at his watch, which read 11:57. Then he vomited all over it.

Pull yourself together! Ten seconds, twenty . . . nothing was happening! It hadn't worked! Then he felt the ground start to shake. There was an unearthly sound, a screeching rumble growing to an earsplitting roar. The instruments went crazy. For a mad moment, Logan thought the bomb had gone off, but then there would have been no time for thinking. . . .

A hundred feet below, the storage vehicle hurtled round its track, thousands of tons of metal traveling at twice the speed of sound. Until now, nothing had impeded its passage. But there was a new factor. The steel mesh reinforcing the tunnel wall was carrying a heavy electric current, creating a magnetic field. Most of the vehicle was nonferrous, but that made little difference. Vast eddy currents began circulating through it. Rapidly, their energy was transformed into heat.

The motor windings were the first to blow, but by then it didn't matter. The vehicle plunged on under its own momentum, glowing dull red, then orange. . . . The suspension began to melt. The storage vehicle sagged, touched, scraped.

Then it fell apart.

BONN: 15 MARCH

After a bath, a debriefing, and some sleep later, Michael Logan kept an appointment. Through the window of the presidential villa he could see the Rhine barges going about their business as if nothing had happened. Heydrich congratulated him warmly, and he left walking on air.

"A sad case," said Heydrich, when Logan had left.

"Sad? The man's a hero!"

"For the moment, Günter, for the moment. But we must never forget that it was Logan whose lax security permitted the bomb to be placed to begin with."

"Sir, he's done more than enough to make amends!"

"Has he? There are 109 dead German soldiers and 462 dead civilians including Erich Kappel. The OK's storage ring is out of commission for at least two years while it's decontaminated and rebuilt. It will need a replacement vehicle, at horrendous expense. Do you really think that a moment's heroics can alter that? Oh, yes, we'll give him a medal. There will be a public version of the story, the triumph of a brave man. But also a private one. I'm not vindictive, Günter. Logan will be given a reasonably well-paid position, probably a desk job in the civil service, preferably abroad. But he will never work for state security again."

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Berger looked at his feet, saying nothing. "Sorry, Günter, but that's all I can do. And there's also a problem with Fräulein Freisler. I have made it clear to her that if she breathes one word of any of this, she will spend the rest of her life in jail for disclosing state secrets."

"*What?* But she—"

"She found an answer that the best scientific brains in Germany had overlooked. Yes, there are excuses—they had a thousand things to think about and no time to do it. But it looks *bad*, Günter. Especially since it was only by luck that she got the message to us in time."

"Sheer bloody obstinacy is a better description."

"You are entitled to your own private opinions, Günter. If your opinions leave this building, so do your career prospects. On the other hand, you deserve to be rewarded for your presence of mind. If you hadn't recognized little Lisl Freisler, it would have been disaster. You've got a great career ahead of you, Günter. Don't waste it."

Christ! Four of us save the country, and what do we get? One gets killed, one loses his job, one gets gagged, and one's bribed to keep quiet!

I'll have to think about it.

HAMBURG: 16 MARCH

The weather was still dismal, the same grey drizzle that had marked the start of the whole drama.

"Bunch of bloody madmen, if you ask me," said the taxi-driver over his shoulder. "Threatening to blow us all to hell and gone, in the name of *peace*, dammit! Crackpots!"

"Hmmph. Turn left at the next set of lights, and go two more blocks," said General Freisler. *What in heaven's name do I say to Lisl now? She'll be convinced it was me who had her gagged. To spoil her moment of triumph.*

He got out of the taxi and paid the driver, his mind in turmoil, seeking answers where none existed. It was all too much. Hundreds dead, and for what? He knew what Lisl would say. "So that a stupid hulk of concrete filled with the deadliest poisons known to man can churn out power to run electric toothbrushes!" He recalled the interminable arguments with his daughter, before they became so regular that she left. "*Cheap?* Rubbish, Daddy dear! By the time you decommission a nuclear power station, the cost of its electricity is *treble* that from conventional sources!"

"*Waste?* Even the word is a lie, it makes it sound like something you put in your garbage can! The half-life of plutonium is *fifty thousand years!* In half a million years, its radioactivity will only diminished to a thousandth of its original level!"

He'd never really grasped what she'd meant, it was all so abstract compared to the obvious need for electrical power and the pollution problems from conventional sources. But what he'd just experienced suddenly made it real. He'd just witnessed the inhabitants of the most disciplined country in the world ripping each other's guts out. *Do we really think we can run a civilization for half a million years?*

The promise was clean, cheap power, a gift from the gods. Like all such gifts, it was a poisoned chalice.

Lefevre, the genius who built a home-

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made atomic bomb . . . al-Nimeiry, who gave his life to save his family, and plotted to murder millions . . . Wagenknecht, who set him up for it . . . Quinn, the organizer, still at large somewhere, laughing at us. That taxi-driver, he thinks they're madmen. But they never intended that bomb to explode, they just wanted us to sign a peace treaty.

I can't approve of their methods, though. They *were* dangerous madmen. But . . . on German soil, also in the name of peace, also never to be used, there are nuclear missiles targeted on a hundred cities.

Lisl was right. We're *all* madmen.

He stopped. He'd reached her apartment-block.

He ran his finger past the rows of names until he found the one he wanted. He hesitated, then pushed the buzzer. It seemed an age until someone answered.

"Lisl Freisler. Who's there?"

"Lisl—" said the general. The next words came in a rush, from somewhere deep within him. He'd already made his decision, he just hadn't consciously known it. Upstairs, the words were distorted by the intercom, but the pain was crystal clear. "Lisl, I was wrong. I've always been wrong. I want to join Green Dawn, if you'll have me. I love you, Lisl. Please come back to me!"

Germany's most famous military commander shuffled from one foot to the other, as nervous as a teenager on his first date, waiting to see whether his daughter would open her door to him. ■

●It isn't what people think that's important, but the reason they think what they think.

Eugene Ionesco

●Loyalty to petrified opinion never yet broke a chain or freed a human soul.

Mark Twain

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The Alternate View

THE SENSES OF HISTORY

G. Harry Stine

How well do we know the past?

Not very well, really.

Until quite recently, we've had to depend upon only the written records of others who lived in the period of interest. Or we have had to view those times through the eyes of artists such as painters and illustrators.

Photography has been with us only since about 1826. The first photographs were made by Joseph Nicéphore Niepce, a French lithographer who succeeded in fixing camera-obscura images on sensitized pewter plates. The daguerreotype wasn't perfected until 1837, and the oldest known photograph of a human being is a self-portrait of one Robert Cornelius made in 1839. Details on the daguerreotype process didn't arrive in the United States until Friday, September 20, 1839 when the packet *British Queen* docked in New York after a transatlantic voyage carrying passengers and cargo. European newspapers and brochures describing the daguerreotype process were among the items on the manifest. Seven days later, the first American photograph—a view of St. Paul's church in Manhattan, was made; it has been lost. The oldest surviving American daguerreotype is a view of Philadelphia made by Joseph Saxton a few weeks later. The oldest known photo of the U.S. Capitol building was made in 1846.

The first American president whose appearance we actually know is Andrew Jackson.

Thousands and thousands of portraits of people were made in the following years. Of those surviving, few are of people who can be identified today. We don't know who some of those people were, what they did, what sort of lives they led, what they believed or thought, what they actually believed was important about the world they lived in, or what they sounded like.

Before 1877, history is silent.

We do not know what Abraham Lincoln sounded like when he delivered the Gettysburg Address. Thomas Alva Edison made his "only original invention," the phonograph, in 1877. Lost is his original recording of his own voice reciting, "Mary had a little lamb." Thus, at last, we were able to record for posterity the voices of William Gladstone, P.T. Barnum, and Robert Browning. One of the first musical recordings was of Brahms playing one of his own works; how tragic that we will never know how Bach and Beethoven really intended their music to sound! We only know what the *interpretations* of their musical scores sound like. And each orchestra conductor and musician plays a score a little differently, just as each painter sees the shapes and colors of a scene through his unique eyes and nervous system.

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We know the past only through filters.

And our senses of history are even today confined to sight and sound.

We do not know what the silk gowns of Roman emperors and ladies felt like; we only know what modern silk feels like.

And we do not know what the past smelled like. I do know that it must have smelled very much like some primitive parts of the world today. Perfume wasn't invented and sold as a luxury; it was almost a necessity in Europe when people didn't bathe regularly and were required to be near one another. A friend of mine who recently returned from the Soviet Union remarked about the totally different smells of the city and the people of Leningrad. . . . and he didn't enjoy the experience. (A.E. Van Vogt's novellette, "Far Centaurus," is perhaps the first science fiction story I know of in which people of the future complained about the offensive body odor of the people who'd just arrived in a primitive hibernation starship.) A few years ago, I visited a "war" of the Society of Creative Anachronism (SCA) where the sights and sounds of medieval Europe had been as faithfully reproduced as possible, but the place had Porta-Johns. I seriously doubt that most of the SCA members there could have withstood the awful stench of a real medieval fair or war. But we will never know what the smells of the past were, and until someone invents a way to record smells, we will never be able to tell people of the future what urban smog is like.

Lack of ability to record what really happened isn't the only problem with history. The further back in time we go in search of what happened, the more difficult it becomes to gain access to the original works of historians.

Sometimes, history is lost entirely. Not only do victors destroy existing records as Rome plowed and salted the site of Carthage, but accidents and time itself wreak havoc.

New political and ideological regimes rewrite or destroy history to suit their requirements. Russian history isn't alone in suffering from this sort of destruction.

Libraries burn down about as frequently as courthouses, both of which act as repositories of records. One thinks, "What a treasure trove the Library of Alexandria would be if it hadn't been looted and burned!" But would it?

Time itself destroys records.

The acid content of pulp paper used to print some of the earlier science fiction paperbacks in my library is causing the pages of these books to become brittle, friable, and yellow. Some drawings I made twenty years ago with India ink on good vellum are fading and yellowing (in spite of the fact that I live in a very dry climate and protect those drawings against the intense sunlight of the southwestern American desert).

Even the best paper is biodegradable and requires exceptional care if it is to last more than 100 years. Inks bleach out to the point where it is now difficult to read hand-written documents a century old.

Documents written on parchment aren't exempt; note the extreme measures to which the custodians of the National Archives go in order to protect both the Declaration of Independence and the Constitution.

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"Setting it in concrete" or engraving it in stone will help records last a little longer, depending on where they are. Marble gravestones in any cemetery provide ample proof of this. Phoenix, Arizona is one of the newest American cities, and the "old" graveyard down by the state capitol building is full of marble headstones whose engraved words are becoming difficult to discern except to people using special techniques.

Don't blame the "air pollution" of modern cities for destroying gravestones as well as the town's statue of General Jubilation T. Cornpone up on his horse. The air pollution in cities less than a century ago was far worse than it is today. Most of you don't remember when the inhabitants of cities and towns, large and small, used coal as a fuel to heat their homes and businesses. If you think that the burning of coal under very carefully monitored conditions at the Navaho Power Station is causing visibility problems in the Grand Canyon today, I recall mornings in Colorado Springs, Colorado, during the 1930s when I couldn't see Pike's Peak from the Antlers Hotel because of the coal smoke in the air.

Destruction of stone monuments of any sort proceeds with inexorable sureness. This even includes the records of Sumer and Egypt, now more than 50 centuries old. Some of them survived because of unique environmental conditions: they were buried and forgotten.

This discussion came about as a result of playing Robert Heinlein's thoughtful and frustrating game of Six Books—i.e., assume you're about to leave on a multigeneration starship or have to duck into a hole for a couple of decades while the radiation from a One-Second Slum Clearance Program dies down; you have time to select and room to store only six books, so which ones do you take with you to permit you or your progeny to rebuild things?

I played this game with the participants of the Byte Information Exchange (BIX) on-line computer network. The results were about the same as when we played it here in this magazine. But a new factor came to light in the BIX discussions:

How do we preserve those six books?

Good paper? Sure, but that goes away eventually. Recording tape? No one knows how long the magnetic domains will remain unchanged, although some reel-to-reel things that I taped 40 years ago still seem to be good. The same holds for floppy disks; some of mine are now ten years old and appear readable if the old disk drives haven't suffered such mechanical wear that they can't read the diskettes. Photography? Again, the paper deteriorates and no one knows how long the silver-compound chemical images will last. Some color film from 50 years ago seems to have held its color sharpness all right, and some hasn't; I suspect the difference has to do with the care with which it was processed.

So are we back to stone engravings, clay tablets, and petroglyphs? Or oral tradition—i.e., story-telling in which history is passed from mouth to brain to mouth over generations, each generation adding another mutation to the information that distorts it?

If so, that's too bad because, although we cannot record everything about the way we live today, we now have a lot of information available, and we duti-

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fully archive it for posterity. However, we have no real way of either preserving it for more than a century or so and knowing what to preserve that future generations will consider to be significant.

We think certain things will be important to people a century from now. But what will be left, even when it's carefully preserved? Enjoy the National Air and Space Museum of the Smithsonian Institution the next time you're there. The *Mercury* and *Apollo* spacecraft, artifacts representing America's first proud, primitive steps off this planet, are slowly deteriorating because they were not designed and built to last. Draconian measures will be required to save them because they're destroying themselves. Where dissimilar metals were joined, for example, electrolytic action is already causing these artifacts to come apart and crumble into dust.

So enjoy history while you're involved in making it. You alone have all the senses of history. ■

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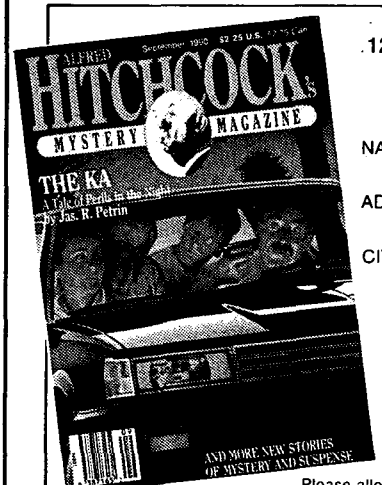

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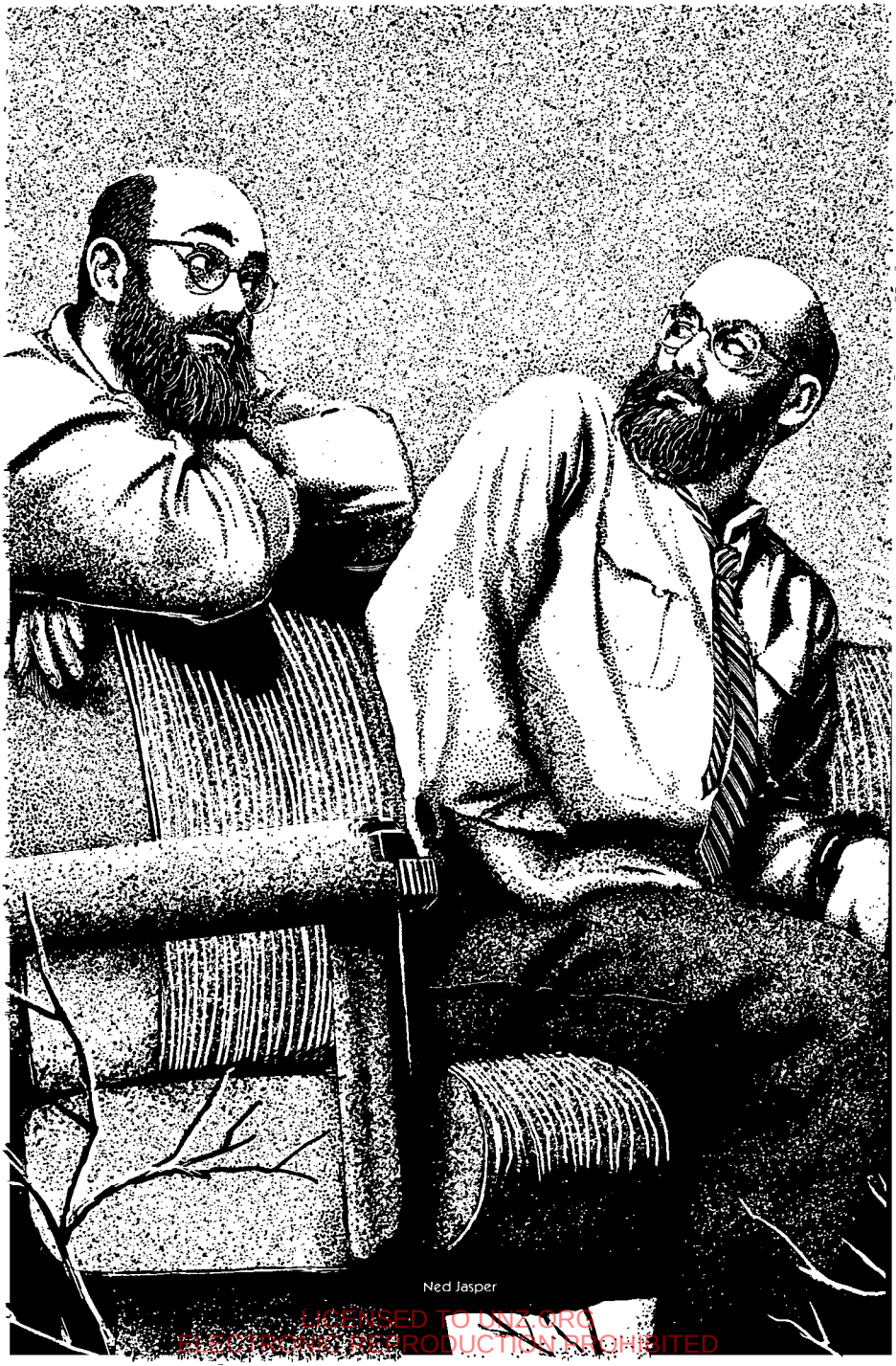

Ned Jasper

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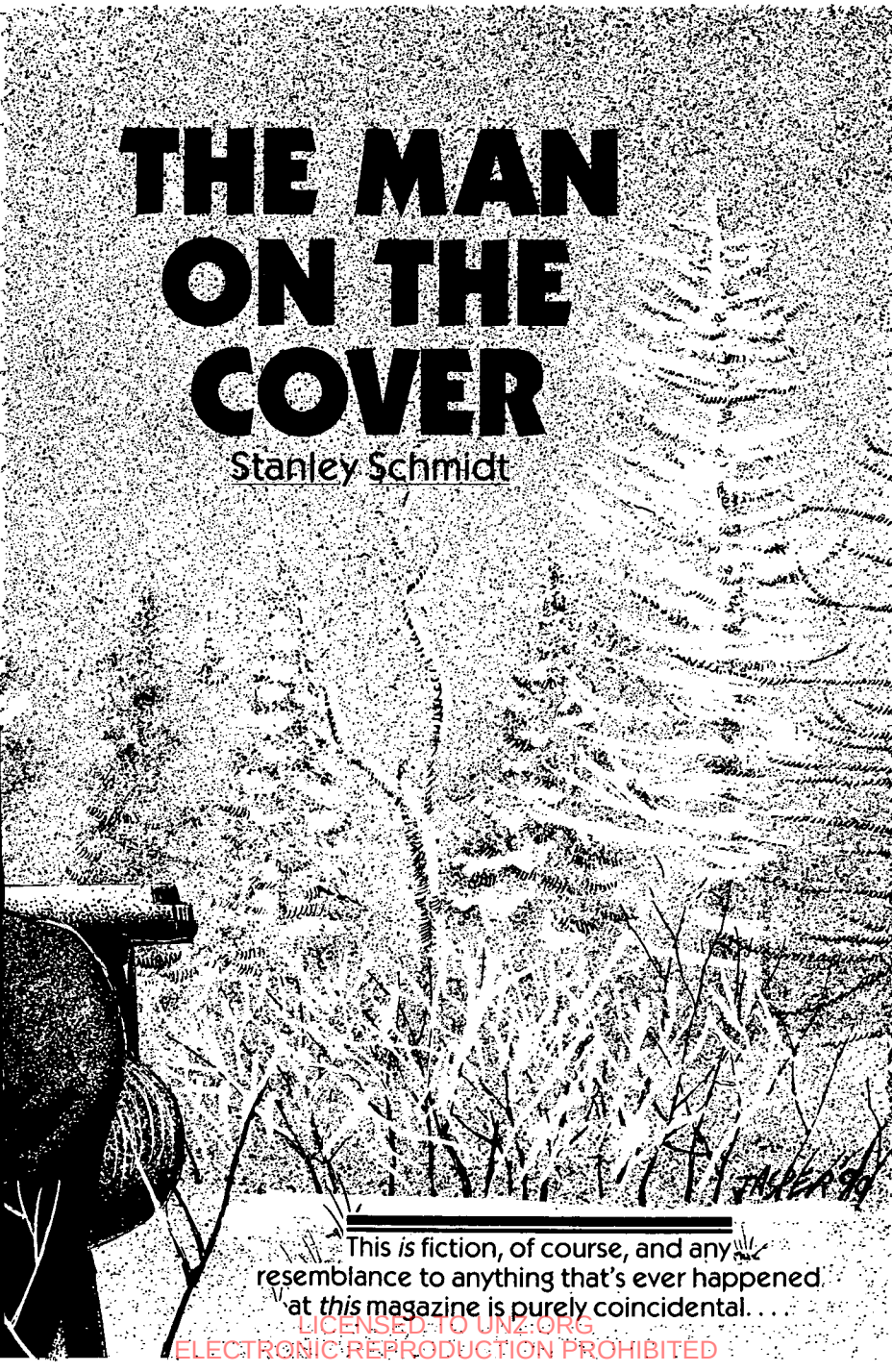
THE MAN ON THE COVER

Stanley Schmidt



This *is* fiction, of course, and any resemblance to anything that's ever happened at *this* magazine is purely coincidental. . . .

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"*Joe!*"

It started as simply as that—with the mild shock of unexpected recognition. Ned Jasper had just brought in the finished painting for our March cover, and I watched with eager anticipation as he stood it on the visitor's chair in my office and lifted up the cover sheet. It was a fine painting: large format, acrylics worked so expertly that the initial impression was that the picture was not a painting at all, but a photograph. Just the kind our readers liked, too: a moment of high tension from the story it illustrated, a hand-to-not-easily-describable-appendage battle between a man and an alien. The alien looked vaguely like a steamed lobster, but a bit more distinguished and a lot livelier. When I looked closer, later on, I could see that Ned had given meticulous thought to how every detail of its anatomy and garb would be shaped by the world it lived on. But I saw none of that then. My gaze was completely held by the human in the picture. A perfectly ordinary-looking fellow, actually, with a bald pate and brown beard like me and millions of others—except that he was a dead ringer for Josiah Carter.

"I beg your pardon?" said Ned, looking around the room. "Who's Joe?"

"The man in the picture," I said, which failed to dispel Ned's puzzled frown. "Also an old and dear friend of mine. Let me guess—you know him, too. Right?"

"Don't think so."

"You *must*. Think. Josiah Carter. Maybe you met him at a convention or something?"

"Sorry," said Ned. A sheepish grin spread over his boyish face. "Actually, I hate to tell you how few conventions I've been to. I know I should, but you know inertia. . . . Anyway, I think I'd remember a name like Josiah Carter. You really think the guy in the picture looks like somebody you know?"

"Exactly," I assured him. "I've seldom seen that good a likeness in a photograph that was *supposed* to look like a real person. It's uncanny."

"Yeah, I guess it is," Ned said, looking a little uncomfortable. "Actually, I did use a real model. A friend of mine, name of Esteban O'Toole."

"From Tulsa?" I asked hopefully. I hadn't seen Joe in a while, and he had been known to pull some pretty bizarre pranks. . . .

Ned shook his head. "The Bronx. I've known him all my life."

"And you didn't use a lot of artistic license? He really looks like this?"

"As exactly as I could make it." He added defensively, "Steve likes it." Then, "So what do you think of the picture? Do you like it, or do you need changes? If the man bothers you—"

"No, no. It's fine. It's a stunning picture—and Joe will get a kick out of it. It's just such a wild coincidence, that's all."

At the time, that's all I thought it was. I've always got a kick out of such things, too, but I've never been very inclined to assign any mystic significance to them. When you're a science fiction editor, strange people and events are your daily bread and butter, and they have to get *very* strange before they strike you as more than just another of

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the universe's endlessly fascinating quirks. Besides, our production schedule is such a long drawn-out affair that it takes at least six months to go from a cover painting to a finished issue of *Stupefying Stories*. In that time, with maybe 4,000 other stories crossing my desk and all the day-to-day tasks and mini-crises of producing a magazine, I practically forgot about the curious case of The Cover That Looked Like Joe (and Esteban). I was even out of town the day the color keys came in, so my assistant, Linette, had to approve them. I didn't even see that picture again until the advance copies of the finished magazine came into the office a month before they would go on sale.

As always, I took one home and handed it to Joyce to let her provide the first objective reader's report. She took one look at the cover and said, "It looks like you."

"I don't look like a lobster," I objected.

"The other one, silly. The one that looks like you."

"Oh." OK, I'd known all along that there was a casual resemblance between Joe and me, but I never thought it went much beyond the fact that we're both bald and bearded (and, of course, dashing and debonair). Among other things, Joe's built a lot more like a football player than I am. "Don't you think he looks more like Joe Carter?"

"Oh, maybe a little," said Joyce. "But I don't look at Joe as often or as close as I look at you—"

"That's nice."

"—so I'm more likely to notice a resemblance to you."

I decided that made a certain amount of sense, but the arrival of the printed magazine, and the discussion with Joyce over who the man on the cover looked like, stirred up my old feelings of the strangeness of the whole business—and I couldn't get them to settle back down. It occurred to me that I had still never met Ned's friend Esteban. How much like Joe did *he* really look? If Ned thought his painting looked like Esteban, and I thought it looked like Joe, and Joyce thought it looked like me—did all three of us really look that much alike? Or did we all three look as different as I thought Joe and I did? After all, nobody sees himself quite the way others do. . . .

I had another month to let it all fade to the back of my mind again. Then the issue went on sale. More than a hundred thousand copies shot out to homes and newsstands all over this continent and a few beyond. One reader who'd met me briefly at a convention wrote in to ask, "Is *that* what an artist has to do to get a cover on your magazine?"

And Joe's wife Marian called. She was giggling. "We thought about suing you," she said, "but not very seriously. Joe's family all thought it was hilarious. What did you do, give the artist a photograph of him?"

"The artist," I assured her, "tells me he's sure he's never met Joe or seen a photograph of him. But he has a friend. . . ." I told her the whole story as it had unfolded so far. We shared a good laugh over it and then talked about other things that had happened since the last time we all saw each other.

Eventually she said, "Well, I gotta go now, and it's about time you did

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some work. The next time we get together, I'm going to give you a picture we have of Joe—same position, same expression, and everything. And I want you to be sure to show it to that artist."

And once again I thought that was that. But apparently Marian got to thinking about how long it might be before our families got together again, and decided she didn't want to wait that long. Two weeks after her call, I was going through the latest batch of office mail and there was an envelope from Marian. Inside, without comment, was Joe—same position, same expression, and everything, just as she'd promised.

As luck would have it, Ned Jasper brought some black-and-whites in that same afternoon. I looked them over and suggested a couple of minor changes. Then I pulled Joe's picture out of the envelope and handed it to Ned.

"My *God!*" he said.

The afternoon mail that Friday brought a letter from a reader in Australia who wanted to know how I'd persuaded some Australian movie star—evidently a character actor quite popular Down Under, though I'd never heard of him—to pose for our cover. And about then the whole business finally began to get to me—me, who considered coincidences a normal part of life and had been taking them in stride for forty-two years.

"It's not just the ones we've heard about in connection with the cover," I told Joyce over spaghetti and meatballs that evening. "Do you remember how often we've seen people on the street who we both thought looked like Joe?" She nodded. "Well," I announced, "I have a theory to explain all this in one swell foop."

"Yes?"

"Elementary, my dear. The reason all these Josiah Carter look-alikes are running around loose is that we're about to be invaded by aliens and their advance force is scouting us out, wearing people disguises so they won't attract attention. Only their budget was cut, like everybody else's, so they have to make do with a few basic models, and Joe happens to be one of them."

Joyce laughed dutifully, not even remarking that she feared I was reading too much of my own magazine, and we both went on to more sensible things.

I thought I was just kidding, too. But when I went in to the office the following Monday, the third letter on my desk was from *them*.

I'm used to nut letters, of course. Every editor gets a few every week, and every one I know has learned to shrug them off—usually. This one was a little different. It was on oddly crinkly lavender paper (no, that's not particularly unusual), faintly perfumed (also not *too* unusual), with a scent somewhere between daffodils, antifreeze, and dill pickles (now that did seem a mite odd). It was neatly typed, though, and politely worded. It said:

It's vitally important that I talk to you today. I'll call at your office at my convenience. Don't be alarmed, but you must *not talk to anyone else about your theory before we meet.*

I look forward to meeting you. Until then, I remain,

Yours sincerely,

AGULAGSKRITCH O'SHAVARANJFFT

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OK, I admit I found it a little more unnerving than most, though I had to read it over a couple of times to put my finger on why. It wasn't abusive or overtly threatening—but I don't care for letters from strangers who *tell* me they're going to visit (I felt oddly certain that the letter used "call" in the British rather than the American sense), rather than asking if they might. Especially when they tell me I must be secretive about "my theory," when I can't remember saying anything in public lately that anyone would identify that way. Oh, I supposed he might be referring to one of my editorials, but I wrote one every month and none in recent memory came to mind as an outstanding candidate for that description.

Or was *"he"* even the right pronoun? The name gave me no clue as to the sender's gender. I'm pretty good at recognizing a wide variety of languages, but I'd never seen one that looked anything like this—especially that "njfft" at the end of the surname (if a surname is what it was).

I dug the envelope out of Linette's wastebasket to see if the return address, stamps, or postmark gave any clues. There was no return address, the stamp was a standard US 25, and the postmark was illegible but otherwise perfectly ordinary.

Which implied that it had been mailed—but the sender felt confident that he knew exactly when it would be delivered. And that was *not* ordinary.

Neither, come to think of it, was that odd turn of phrase in the middle: "I'll call at *my* convenience. . . ."

After a bit of deliberation, I filed it appropriately. No, not the circular file—every editor I know has a "Nut File" where he preserves some of the more memorable items that cross his desk. I wasn't sure this one was interesting enough to really deserve a place there, but it could stay there while I made up my mind. And it seemed much too vague to turn over to the company lawyers—at least not yet.

It wasn't until midmorning, when I was standing in line to buy a donut from the pushcart that came through the halls twice a day, that the weird idea flashed into my mind that the theory referred to in the letter was the one I had jokingly mentioned to Joyce a couple of days earlier. It didn't make any sense, of course, but I found it harder and harder to get it out of my head.

My original intention had been to do nothing about the letter except forget about it as quickly as possible. But by lunch time I found myself fishing the letter back out of the Nut File to leave with Linette. "I don't really believe this means anything," I told her, "but if anybody should happen to call with a name that sounds like this looks, I do *not* want to see him, her, or it. If he thinks he has business with me, tell him to spell it out in a letter."

Linette looked quizzically at the name. "How *does* a name that looks like that sound?" she asked, quite sensibly.

"I haven't the foggiest."

As I left, slipping furtively out into the hall, I hoped she didn't think my behavior was *too* irrational today. Nevertheless, instead of going right downstairs to MacDougal's Deli, I detoured to the eleventh floor to tell Leigh, the company receptionist, the same thing I'd told Linette. He boomed back

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in his voice that matches his grizzly-bear build, "Sure thing. I won't send *anybody* down without your OK." Leigh used to be a Marine drill sergeant and is reliably startling to the uninitiated who have preconceived notions about what a receptionist named Leigh should look like. With him on the lookout, I felt fairly well protected and got through lunch without incident—though I did find myself watching the other customers in the deli a bit more closely than usual.

Fortified by lunch, I actually managed to concentrate on my work during the early afternoon. I'd almost forgotten the silly letter—until Leigh called at 2:30. "Mr . . . uh . . . the gentleman you were expecting is here."

"I'm not," I said. "Tell him to go away."

"I did. He said he'll wait."

"Oh." Hardly what I'd hoped for, but as long as the gentleman was acting like a gentleman, there wasn't much I could expect Leigh to do about it. What he could do physically and legally were, after all, two quite different things. "Just don't tell him where my real office is, OK?"

Somehow that seemed an oddly forlorn hope. The company is officially located on eleven, but has grown tentacles throughout the building. There's nothing posted anywhere to tell visitors that I really live on nine, but considering how much else this character seemed to know about me that he logically couldn't, I had no reason to assume he didn't know that, too.

But then, if he did, why didn't he just bypass Leigh and come down on his own? Could it be that he really *was* a gentleman?

My curious bump is as big as anybody's. The more I thought about it, the more part of me wanted to meet this guy. But so far that part hadn't been able to overrule the part that said I shouldn't get mixed up with him.

So I passed the afternoon apprehensively and none too productively, and at five o'clock tried to sneak out. Not too hard, in principle; if my Mystery Man was waiting as he'd said he would, he'd be watching for me to pass Leigh's desk. But the freight elevator didn't go there, and starting from nine, it didn't have to go to eleven at all.

I felt pretty pleased with myself as I stepped out into an afternoon of bright sun and bracingly chilly breezes, still apparently alone. For good measure, I stretched my usual seven-block walk to Grand Central to eleven, walking briskly and congratulating myself on my uneventful arrival.

Somebody *did* latch onto me there, but Grand Central is so full of seedy characters that I thought nothing of it. All I heard was a man's voice behind me saying, "Sir, I'm trying to get to Bronxville and I'm two bucks short. Perhaps you could—"

"Sorry," I said without looking back, and half a minute later I was slipping with inordinate relief through the waiting door of the train car I always rode home.

I was already sitting down before I realized there was nobody else in the car—and the door had just hissed shut, fourteen minutes before scheduled departure. And then I realized that there

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was somebody else aboard, and he was slipping into the seat next to me.

"I'm sorry we had to do it this way," a quiet, oddly familiar voice said, "but I really *must* talk to you today."

I turned and stared into the burly face of Josiah Carter.

Before I could react to that, the train made a very soft, very un-trainlike noise, everything blurred for just an instant, and we were Somewhere Else. There had been nothing but black tunnel outside the windows; now there were winter-bare skeletons of trees and deep, soft-looking snow—clean and untracked. Something in me made an automatic adjustment and I found myself thinking with surprising calmness that the thing responsible for the sudden scene change was probably not a time machine. The snow, trees, and late afternoon sunlight were all appropriate to the season and time of day I thought it was. They were *not*, however, appropriate to Grand Central or the Park Avenue Tunnel.

"Well, Toto," I muttered to nobody in particular, "I don't think we're in Manhattan any more." I turned to "Joe." "Neat trick. How did you do it?"

Joe—let's drop the quotation marks for simplicity, but not forget they apply—smiled amiably. "Very good," he said in a reasonable but not perfect approximation of the real Joe's voice. "With some people we'd be wasting the first hour trying to dispel hysterics. I'm glad to see you're not one of them."

"A life immersed in science fiction helps," I told him, all the while wondering privately whether it would help enough. Sure, I tell people SF helps immunize people to future shock—but I was discovering that reading about something like this in a story and having it happen to me were two quite different things.

"Indeed it does," he nodded. "It will probably help me answer your question, too, to the extent that I can. The general language of your culture has a serious deficiency of appropriate words, but your special field has some that come close. Suppose I said the device we used was a translocator, and the train car you walked into was an illusion set up to get you into it. No one else could see it."

"Hmmm," I said. "A transdimensional trap baited with a customized hallucination. Makes me feel a bit like a mouse." I tried not to think about cats. "Couldn't you have just asked me nicely?"

"We did. You declined."

"Oh." I squirmed uncomfortably and wondered whether the enclosed space we shared still looked like a railroad car from outside. "Maybe we'd better take this from the top. Only I don't know where the top is—what I should ask you first. Where are we now?" The thought crossed my mind that I was supposed to be halfway home to Joyce, hot brisket and gravy, and a comfortable recliner in front of a crackling fireplace.

"You would call it . . . " He paused, and I half expected him to say something like "A small planet of Epsilon Eridani." What he really said was, "Rockland County."

"Oh," I said, dizzily readjusting my horizons yet again. "I don't suppose you're from around here?"

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A wistful expression flickered across his face. "No, though I've been here so long that sometimes it feels like it. Actually, Mr. Kowalski, our home is quite as far away as you've guessed. But we need local bases while we're working here, and for reasons that may be obvious, we'd rather they didn't attract too much attention." He cleared his throat. "Which brings us to the rather awkward situation you've put us in—which we so urgently have to discuss."

"I'm glad you brought that up," I said, noting that my throat was a bit dry. "Maybe you could fill me in on that. I'm afraid I don't understand what it is that you think I've done."

His half of the chair separated noiselessly from mine, and both halves moved apart and rotated to face each other. "There," he said, crossing his legs, "I think that's more comfortable, don't you?

"We realize it wasn't intentional and you probably don't even realize you did it. Unfortunately that doesn't make it any less of a problem for us—and it *is* a problem, Mr. Kowalski, that neither of us can afford to underestimate. Do you recall a conversation you had with your wife last Friday?"

Something about that sounded very wrong. "I recall several conversations I had with my wife last Friday. I don't recall that any of them were any of your business."

"No need to get huffy. As it happens, this one *is* our business, I'm afraid. I refer to the one in which you expressed a hypothesis about why you were encountering so many people who looked like the man on your cover."

It's not easy to make me angry, but that did it. "Have you got a bug in my house? I'll—"

"Easy, Mr. Kowalski. No, we don't have any bugs or cameras in your house. We don't need them, any more than we had to ride one of those disgusting trains for an hour to get here. But we were listening, in our own way. And whether it was a joke or a lucky guess or something more serious, it was entirely too close to the truth. We couldn't afford to risk having you realize that and start blabbing it about."

Something started crawling up my spine. "You mean you really are an advance guard for an extraterrestrial invasion?"

He laughed. "In a manner of speaking. But we don't need advance publicity. So what are we going to do about you?"

I didn't have an answer for that that I wanted to say out loud, but I could think of several I hoped *they* wouldn't think of. Evidently I really had, however unwittingly, created a problem for them—and that meant I had a problem, too. To put it mildly. "Maybe we can work something out," I said uneasily, "but I can't help you unless I know more about what's going on. What do you mean, you're an invasion 'in a manner of speaking'?"

"Well, you're thinking in military terms, right? We're *not* planning to sterilize the Earth, or anything stupid or melodramatic like that." Thank goodness for small favors. "That wouldn't be good business for either of us, now, would it?"

"Business?"

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"Of course. Our invasion is an economic one. We want to participate in trade with you folks." I relaxed a lot; if all they were interested in was trade, I shouldn't have to worry about all the cloak-and-dagger things I'd been imagining for the last couple of minutes.

He must have noticed. "I get the impression," he cautioned, "that you think that means you no longer have to take the matter seriously. Neither of us can afford to feel that way, Mr. Kowalski. If you think an economic invasion is less serious than a military one, I suggest that you consider the present role of Japan in your own subculture—and some of the stories you've heard about corporate skulduggery right here at home."

He was right. I unrelaxed, and resumed imagining horrible things they could do to me. I also tried to imagine things I might do to prevent them, but I was a lot less successful at that. Escape sounded good, but I had no idea how to open this thing I was in, even if I could distract or incapacitate Joe so I could try. And even if I did get outside . . . well, I knew Rockland County well enough to know that if we were anywhere in it, I could reach a road in less than a day's walking. But I didn't have anything like a day's worth of daylight, and I was certainly not dressed or equipped to spend a night outside at this time of year.

So whatever happened was going to happen right here, in this railroad car that wasn't, between Joe-Who-Wasn't and me. "The basic problem," he was saying, "is that while we want to trade here, we are most strictly prohibited from doing it openly. You people are not to suspect that people like us are among you, even if we do get to exchanging goods and services."

"Let me guess," I said. "That's why you look like Joe—not because you were born that way."

He nodded. "You got that right. Unfortunately, you did it on your own, Friday night—and if corporate HQ finds out, they'll blame us for giving you too many clues. This would not be good for us—so we don't plan to let it happen."

I didn't like the sound of that, but all I could think of to say was, "*Corporate* HQ?"

"Yes. I told you this was a business venture. I don't represent a galactic government, or anything like that, Mr. Kowalski. The firm I work for is small potatoes, galactically speaking—rather like the one you work for, in that respect." I couldn't deny that, galactically speaking. "Corporately speaking, we're hoping to do something about that. And personally speaking, I have to cover my rear. I think we both know what *you* would do if you had made a mistake that was going to get you in big trouble with your boss, and your boss didn't know about it yet. Don't we?"

"I suppose we do."

"You'd try to prevent repercussions and make sure he *didn't* find out. So you understand what I'm going to have to do. Basically, our problem is to make sure you don't talk about us—and make sure it doesn't happen again."

The thing that had earlier started creeping up my spine was now gnawing as it went. The obvious way to make sure I didn't say anything about what I had thought was an idle jest was simply to eliminate me. They'd already made

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me disappear, and the disappearance could easily be made permanent.

Except then the one person I'd already talked to just might make the connection and start talking, so they'd have to eliminate her, too. . . .

And I was *not* going to let them eliminate Joyce!

"Why would I talk?" I babbled, talking maybe twice as fast as I was thinking. "Maybe you don't understand human psychology as well as you need to. If I told the truth, everybody would think I was crazy."

"Not everybody. Surely you realize that more people read those tabloids at supermarket checkouts than just about anything else in your culture?"

I blinked. "I take it you read them too?"

"Only because we have to. We monitor all media we know about that have a record of publishing things that sometimes get too close to our personal truth. That includes the tabloids, grotesque as their fabrications are—and science fiction magazines, which reach fewer people but ones who must be taken more seriously. And sometimes they get *too* close. That, in case you were wondering, is why we've been monitoring you for quite some time."

"Yes, I was wondering." I cast about wildly for another idea. "Look, as I see it, this is where we stand. I've mentioned the idea that you were here and you were using Josiah Carter bodies as a cover, but I've only mentioned it to one other person and neither of us took it any more seriously than we take those tabloid headlines. If you'd stayed out of sight, neither of us would have given it another thought. So why didn't you?"

"We couldn't take that chance, Mr. Kowalski. You might have become obsessed with the idea and started pursuing it seriously."

"So why not wait and see if that happened before you showed yourselves?"

"By then it might be too late as far as my boss and I are concerned. Remember, Mr. Kowalski, I have a job I want to keep. It may not be the greatest job I could have, but it's the one I do have and I'm not going to let you jeopardize it."

"But . . . you said you're not allowed to let us know you're here. That sounds like a noninterference rule. Surely you wouldn't be allowed to . . . uh . . . do anything *drastic* to a native."

He smiled the first truly (and impressively) unpleasant smile I'd seen from him. "Allowed? No, of course we're not allowed. But recall that strong circumstantial evidence suggests that we've already committed one rather serious transgression. How long do you think we'd balk at committing one more as a means to keep either from being discovered?"

I shuddered. He might be bluffing, but I couldn't afford to assume so. However, I did suddenly notice something that seemed rather peculiar about his action. "OK," I said, "I sit warned. But if you were going to . . . do something drastic . . . wouldn't it have been best just to do it as quickly and quietly as possible?"

"Perhaps."

"So why am I sitting here talking to you?"

He smiled again, a little less unpleasantly. "*Touché*, Mr. Kowalski. A perceptive question—which gives me some

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hope that bringing you here was worthwhile. You're here because we hoped to get some information from you. I mentioned that one thing I wanted to do was make sure that nobody else guessed we were here. As one who did, you might be able to give us some advice on how to make sure no one else does."

"Not really," I said, wishing I could if it would strengthen my position. "As I told you, I didn't really guess. I said words that had some resemblance to the truth, but I didn't know they did, or even suspect it. So it wasn't really a guess at all. And it was suggested by a series of coincidences, but everybody experiences coincidences . . . Hmmm, maybe I can make one little suggestion. Not all coincidences involve Josiah Carter look-alikes. Maybe you should quit using those."

The Josiah Carter look-alike sitting across from me shook his head. "I wish we could, but it's not practical. You were basically right about our budget, you know."

I felt a fleeting impulse to laugh out loud. "You mean you really do all look like Josiah Carter?"

"Not *all*," he said, a little testily. "Our budget's not *that* small. We have four models, actually—but you never heard that from me." He stared out the window and murmured wistfully, "I told them it was false economy to rent simulations from that cut-rate outfit, but would they listen to me?"

I felt a surprising rush of sympathy for him. Alien he might be, but who among us has not been in a similar situation? "Look," I said, "you have my word that I'm not going to go blabbing about you. The fact that I know how easily you can do away with me and my wife should be enough assurance that I won't—"

"Not in a culture that considers it virtuous to 'die for your country.' "

"Oh. Well, keep it in mind anyway. Suppose I can find something else to throw in the pot. Suppose, for instance, your company and mine could strike some kind of a business deal, so that we both had a vested interest in keeping things as they are—including leaving me alive and functional."

I thought I saw little alien dollar signs light up in his eyes, and for the first time since I got here felt a little glimmer of hope that I might yet get home. "What did you have in mind?" he asked.

"I'm not sure. What do you folks sell? For that matter, what do you take in payment?"

"Varies," he said. "Actually . . . Oh, why not! Let me spell out the truth for you. We need all the help we can get. At this point Earth is not yet really a market. It's just a potential market—and a product. My group is here to do a market study to see what potentials might be here. So far we've come up with so little that my boss's boss is breathing down his . . . neck. If we don't come up with something more, and soon, they're going to pull us out of here and send us all to some place where we can't waste so much company money."

Aha! I thought. *Maybe I'm onto something here.* . . . "You say you haven't found much. But you have found something?"

He shrugged. "Well, there is the tourist market among our own kind.

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You wouldn't notice them, of course; they'd come in simulations like this, and we'd try to price the tours so they'd get *quality,* and no two alike. We're pretty sure there's money to be made there, for our company if not for our civilization as a whole. This is a pretty little planet, with some highly marketable quirks. 'See an emerging culture actually facing its energy crisis! Will they make it?' And you do get uniquely lovely eclipses here, though not often enough to give us much volume—''

''What else?'' The more I knew about what they'd *like* to buy or sell, the better my chance of being able to suggest one they hadn't thought of.

''Not much, really. Oh, I'm sure we can peddle some of your cultural artifacts back home—but frankly, when you've seen as many cultures as we have, most artifacts start to look alike. We need something that stands out as *special.*''

''Hmmm.'' I stared at him, wondering what they would consider ''special,'' or how I could frame the question in a way that might elicit a useful answer. I didn't come up with much, but as I stared I was suddenly struck by another wild possibility. ''Let's put the question of what we can sell you on hold for now. You've already told me what you can sell each other. Have you thought about what you might sell us?''

''Well,'' he said, a little hesitantly, ''there is one thing—''

''Because,'' I went on without waiting, ''I think I just thought of something that might really work.''

He stopped in midsentence. ''Really? What's that?''

''Those bodies. No, not Josiah Carter, specifically; I'm not sure we need any more of those. But you said you can get them to look like other people. I can see a real market for look-alikes. Back when I was teaching college, I would have been glad to have one to sit in for me in some of the duller faculty meetings. And of course Hollywood is always looking for people who look like other people—''

''You really think there'd be a wide market for them?'' Joe asked, seeming genuinely interested.

''Yes! And how about government? The thought of thousands of copies of our President running around is a little scary, but it would certainly confuse potential assassins and such. You should definitely contact the Secret Service.''

''Already have,'' said Joe. ''That's one market we've had for years, though I wouldn't have mentioned it if you hadn't guessed. The wider market, though, is something we hadn't realized was there. We'll certainly look into it—though there is still the problem of what you could pay with.'' He paused.

I'd been wondering how they handled currency conversions, but decided now wasn't the time to ask. He seemed to have something else on his mind, but needed a little prodding to get it out. ''You mentioned having something else in mind that you could sell us,'' I reminded him.

''Oh, yes. That's the other reason we've been watching you and people like you. You edit a science fiction magazine. I wonder if you could take a look at a couple of stories. . . . ''

That time I did laugh out loud. Every writer and editor periodically gets

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trapped by would-be writers who just happen to have written something and want professional criticism, but I didn't know many who'd ever been trapped quite so literally—or by real aliens. When I explained why I was laughing, Joe wasn't offended, and even laughed along with me. But he did present me with a couple of manuscripts and urged me to let him know what I thought of their suitability for *Stupefying*.

Normally I would have told him to submit them in the usual way, through the mail with a stamped, self-addressed envelope, and no requests for individual criticism, please. I hope my other contributors will forgive me for making an exception in his case. I sat right there and read them on the spot, with him watching—something I normally hate and refuse to do.

When I finished, I handed them back with genuine regret. I would have *loved* to publish a story by a genuine extraterrestrial, even though I wouldn't have been able to let anybody else in on the joke. But . . . "They wouldn't go over," I said.

"What? But this is the way these cultures really are. . . . "

"I realize that—but the jump is too big. I know you've been reading the magazine I'm editing now, but have you ever looked at an issue from say, forty years ago?"

"No. That didn't seem relevant to what we were after. . . . "

"But they are. I didn't see it myself until I read your stories, and I'm sorry to have to tell you. Look at the pictures in our old magazines and you'll see people at spaceship control panels covered with huge knobs and vacuum tubes. You'll see computers the size of houses that can't do any more than the one on a corner of a student desk in my nephew's bedroom, which he uses mainly to play games. My point is that science fiction writers are the most imaginative people of their time, but they still are people of their time. The way they imagine the future is shaped largely by the world of their own present. If you show them the way the future's *really* going to be, it's more change at once than even they can handle. Reading your stories was a fascinating and humbling experience, but I could never sell them as fiction. The only way my readers could accept them would be if I told them exactly what they *really* are—and that, I gather, is the one thing you can't let me do."

Obviously disappointed in a way I'd seen painfully often, Joe put his stories away. "However," I said, "I do have one more suggestion to make."

"Oh?"

"How about running it the other way? You say you're looking for cultural artifacts that would seem 'special.' You also said most artifacts from most cultures get to look alike. But you *also* said one reason Earth was a tourist attraction was that our civilization is passing through a crucial phase of development. How many artifacts have you collected that are clearly and unmistakably artifacts of a culture going through that crisis?"

"Well, I'm not—"

I didn't wait for him to finish. "Well, I've got it for you!" I told him excitedly. "My audience couldn't accept your mainstream literature as science fiction because it's too far out. But I'll

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bet *your* audience could enjoy ours—not as 'speculative fiction,' but as an inside look at how an emerging culture imagines the future!''

I waited—and a moment later a grin, still slightly tinged with doubt, spread across Joe's face. ''I like it! I think it's just what we've been looking for. But—do you really think we can work something out?''

''I'm sure of it. Let me put you in touch with our sub rights director. She'll be just as enthusiastic as you—and she's very discreet. Of course, I'll have to get back where I belong to talk to her. . . . ''

There were more details to work out, of course, but basically that's how it ended—to the extent that it did. For me, Alien Joe, and both our companies, it was a happy ending. Two hours after that conversation, I was home with Joyce, the brisket, and the fireplace, and the next day I was back in my office. Now Joe's company is getting rich on the hottest ''alien artifact'' fad to come along in quite a while, *Stupefying* and its authors are up to their ears in reprint royalties, and Joyce and I are getting quite a comfortable cut for ourselves—not the least of which is the knowledge that Joe's company now has a vested interest in seeing that *nobody* does anything drastic to us.

For Earth, of course, it's more like a beginning. Not very many of us know yet about O'Shavaranjfft's Yarn and Body Shop, or the Federation behind it, but they're here to stay. For the time being, their budget is letting them use a much wider range of camouflage models. But they're already looking ahead to the day when camouflage won't be necessary, and the whole relationship between us and them will be open and above board. I'm looking forward to that.

And Joe—the real, original Josiah Carter who unwittingly started all this? You're wanting to know: is he really one of us or one of them? Well, I'll tell you: I don't know—and I don't care. As far as I'm concerned, he's still the same Good Ol' Joe he always was.

And that's really all that matters. Isn't it? ■

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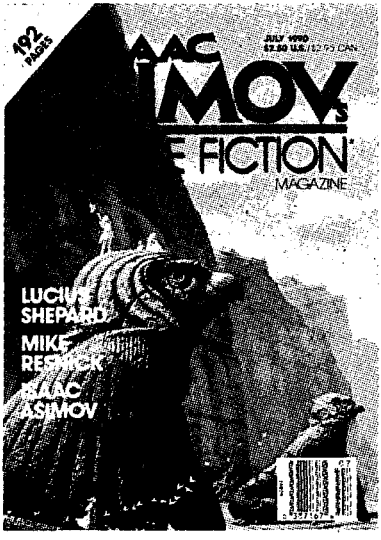

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THE 1989 ANALYTICAL LABORATORY

Photo credit: *Locus*, Charles N. Brown

From left to right: Tina Lee, Stanley Schmidt, Lois McMaster Bujold, Amy Bechtel

Just in case you missed our July 1990 issue, here's a recap of all our winners:

"Labyrinth," *Lois McMaster Bujold*—Best Novella
"The Happy Dead," *Amy Bechtel*—Best Short Story
"The Ape-Man Within Us," *L. Sprague de Camp*—Best Fact Article
April: *Todd Cameron Hamilton,* for "The Gentle Seduction"—Best Cover.

The awards were presented at a breakfast celebration in San Francisco's Hyatt Regency Embarcadero on April 28, over the Nebula awards weekend in conjuction with *IAsfm's* Readers' Awards. Unfortunately, winners L. Sprague de Camp and Todd Cameron Hamilton were unable to attend. But author Marc Stiegler, whose story inspired Todd's prize-winning cover, was happy to attend in his stead and certainly seemed to relish his breakfast.

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CONGRATULATES THE WINNERS OF THE 1989 NEBULA AWARDS

given by the Science Fiction Writers of America

Best Novel
THE HEALER'S WAR
by Elizabeth Ann Scarborough

Best Novella
"THE MOUNTAINS OF MOURNING"
by Lois McMaster Bujold
(*Analog*, May 1989)

Best Novelette
"AT THE RIALTO"
by Connie Willis

Best Short Story
"RIPPLES IN THE DIRAC SEA"
by Geoffrey A. Landis
(*IAsfm*, October 1988)

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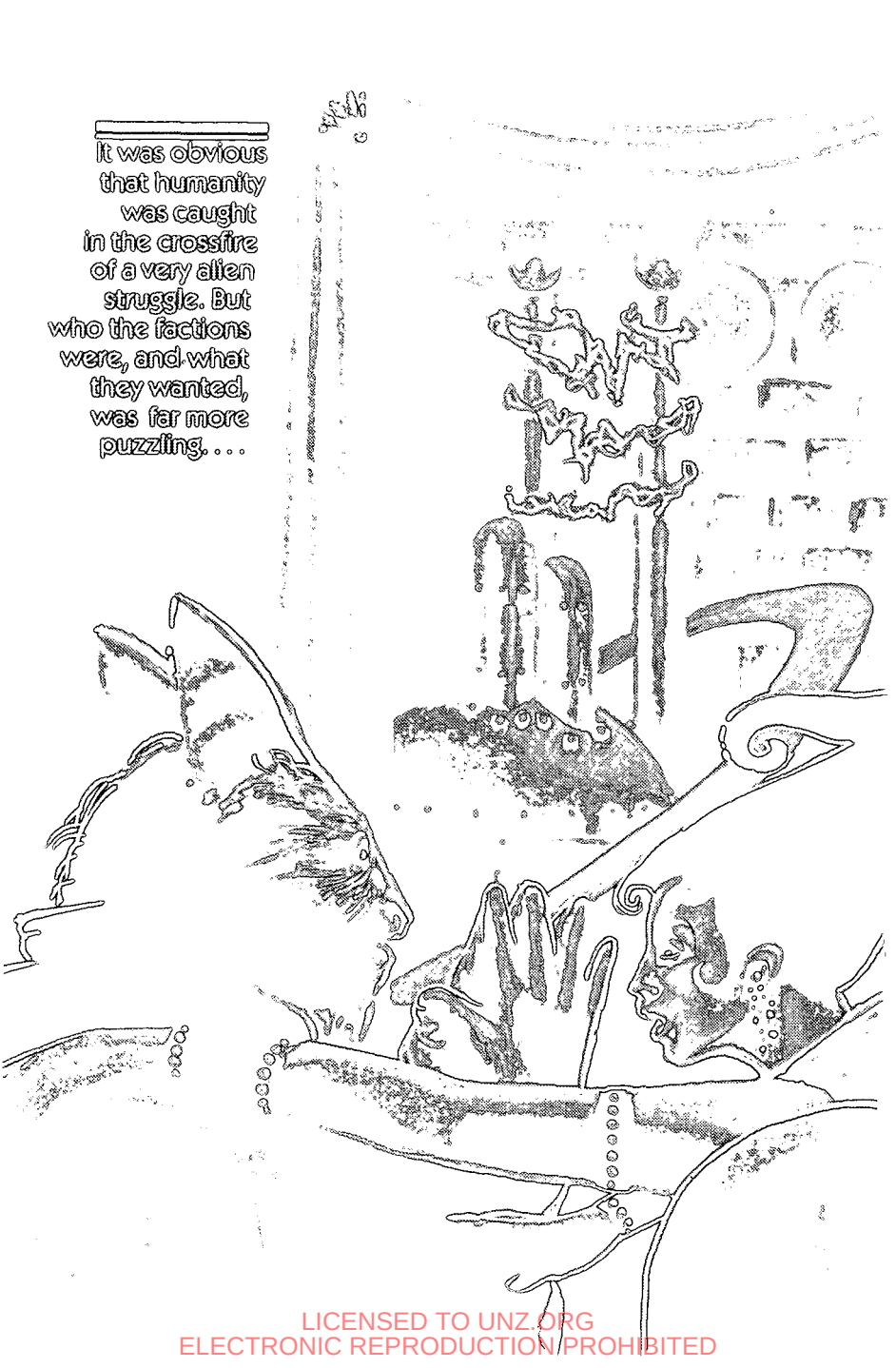
It was obvious that humanity was caught in the crossfire of a very alien struggle. But who the factions were, and what they wanted, was far more puzzling. . . .

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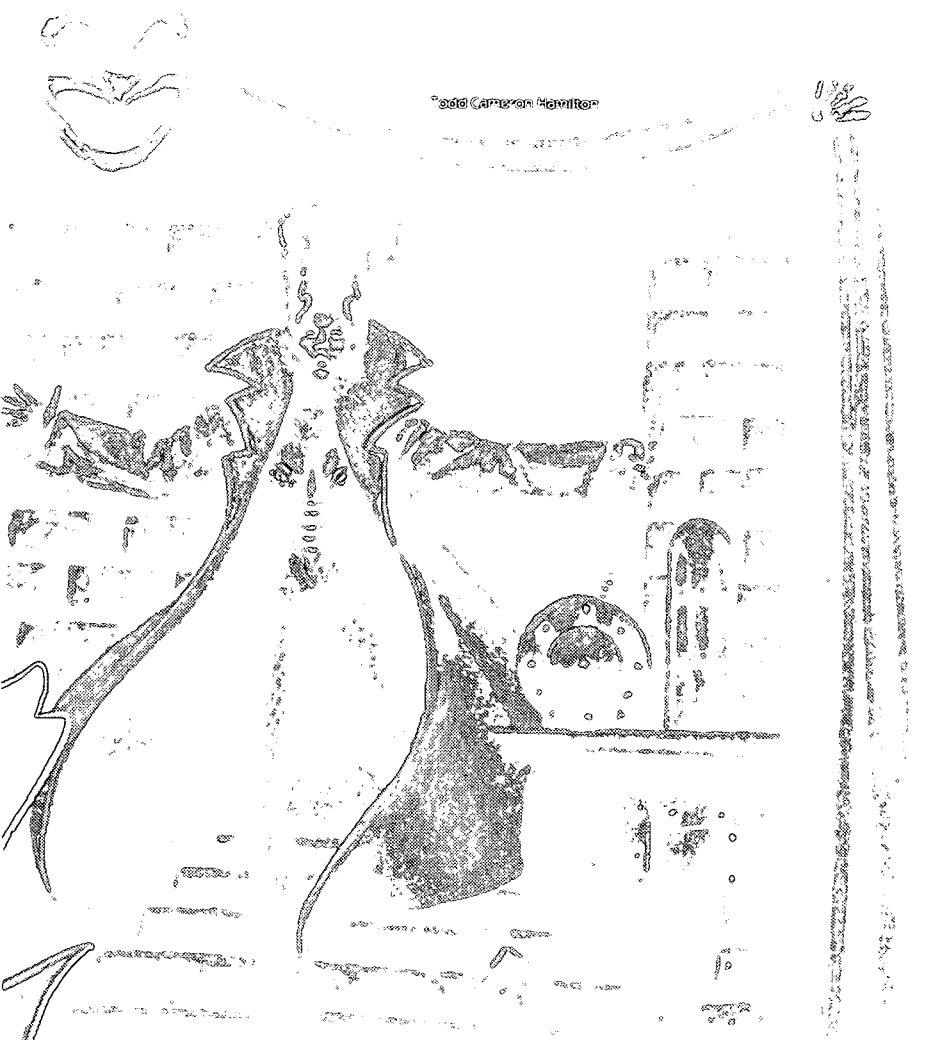

(part II)

OUTLAW

W. R. Thompson

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SYNOPSIS

I like to live dangerously; that's how I ended up marrying **Nancy O'Donough,** *the diplomat from hell. Nancy works for the United Nations, where she applies her talents to Earth's problems with alien races. And she is very talented; to give just one example of her diplomatic skills, she got me to take* her *last name when we got married, and she made it seem perfectly reasonable. Me? I'm* **John Baxter O'Donough,** *biologist.*

Our honeymoon at a country hotel in Vermont was interrupted by **Vse,** *a* **Kya** *biologist of our acquaintance. The kya are a humanoid race, technologically a century or so behind us, but intelligent and motivated to catch up with us. The UN and the kya were supposed to sign a treaty which would put all of us on an equal footing. Now Vse came with word that the UN was backing out of the treaty.*

That was suicidal. The treaty was more or less imposed on us by the **Nomads,** *a species which evolved in interstellar space and which has a habit of exterminating races which displease it—they had recently laid waste to a planet named Correy III. The terms of the treaty were advantageous to the Nomads, and I didn't want to think about what would happen if the human race displeased them. Nancy tried to find out what was going on, and learned that some Nomads had just arrived at our colony on Pluto.*

Strictly as lagniappe, we got kicked out of the hotel. The three of us went to New York, ostensibly to room with Nancy's parents. **George O'Donough** *was a music-industry mogul with a variety of political connections which Nancy put to use. While George pulled strings to find out what was going on, I met my mother-in-law,* **Maya O'Donough.** *Thirty years ago you would have known her as Manic Maya, singer of punk-protest music. We took an instant dislike to one another. It was nothing personal; Maya hated everyone, including her daughter.*

So much for my first day of married life. The next day I found myself discussing vigilantism, violence, and the social effects of overcrowding with Maya. The conversation grew so grim and depressing that it gave her an idea for some new music. While she got her old band together, George told us what he had learned. The Nomads at Pluto had offered the UN an urgent business deal, and they wanted something built by **Chris Dowling,** *a buddy of George's who ran the Orbidyne space-construction conglomerate.*

On our way to see Dowling we were arrested by the UN; I was to be charged with violating UN Resolution 1453, which prohibited giving scientific information to the kya. **Ambassador Wilkes** *had arranged my arrest to force Nancy to stop prying into the current Nomad crisis. Vse turned the tables on Wilkes and got her to drop the charges, while Nancy persuaded Wilkes to be reasonable.*

We found out that the Nomads wanted Orbidyne to build a solar power collector. It was a big son of a gun, to be built on the planet Mercury and capable of handling more energy than the Sun could produce. How did it work? Why

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did they need it? Good questions; to search for answers, Wilkes had us sent to Pluto aboard the starship Aurora, *commanded by our friend* **Lev Akhmetov.**

When we got to Pluto we found that the Nomads wanted the collector, bad, *and if they didn't get it within a month they'd wipe out Earth. We noticed that these Nomads were wearing heatshields against the Sun's output; Pluto is cold, but it's still warm enough there to boil the liquid helium on which Nomadic biology is based. They were also using radar jamming and other countermeasures, which Lev noted were strictly military tactics.*

We didn't know what was going on, but we had some frightening hunches. Aurora *headed into the Oort comet cloud on a mission to learn about the Nomads. We thought we knew where we could find them; their equipment generates neutrinos, and our telescopes had pinpointed several neutrino sources near the solar system.*

We found more Nomads—or they found us. While I was on a spacewalk to study the cryonic lifeforms infesting a comet, a Nomad appeared—and started shooting at me with a laser. It was a bad shot, which is why I'm here to tell this. I beat it off with a blast of nitrogen from my suit thrusters. That puff of gas must have felt like a blowtorch on its bare hide.

Other Nomads appeared and we ran away. Unlike the Nomads at Pluto, and the ones we'd met elsewhere, these Nomads didn't wear heatshields, didn't use military countermeasures and didn't communicate—but they did use weapons. Again, only their bad shooting let us escape. Lev noted that, while violent, they acted more like a rabble than an army. However, it became obvious that there are two groups of Nomads, mutually hostile . . . . and Earth is caught between them.

We had more cheering news when we got back to Earth. Wilkes and some other UN leaders had analyzed the situation, and decided that Nomadic society had split into two cultures, and they were at war. They called the Nomads at Pluto the **Timids,** *deciding that they were losing their war. The group which attacked* Aurora *was labeled the* **Bolds**— *a bit trigger-happy, perhaps, but winning. In the interest of human survival, Wilkes decided, humanity had to side with the Bolds. Nancy objected, pointing out that we didn't know enough to make such a guess—but politics won out. Nancy, worn out from her work of the past few months, gave up and took a leave of absence from the UN.*

Meanwhile, Dowling's scientists had figured out how the Nomad power collector worked. It surrounded the entire Sun with an efficient power-collecting field. Turn it on, and it would absorb all of the Sun's output, which would freeze Earth in short order. The UN wanted to cancel the collector, but Nancy persuaded Dowling to resist their efforts. While all of our choices looked equally fatal, our best bet lay in cooperating with the so-called Timids, and hoping that their plans included our survival.

PART II

11

That afternoon Nancy and I took out a month-long lease on a furnished multi overlooking upper Central Park. It was

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expensive, but we shared the unvoiced suspicion that a month from now the cost wouldn't matter.

Costly or not, I liked it. A spacious bedroom, two bathrooms, a kitchen, carpets and freshly painted walls—it was quite a change from my old digs on Kya. I wandered into the kitchen and checked the cupboards. Empty. "Looks like we're eating out tonight," I told Nancy.

"Uh-uh. We're going to bed early tonight." She checked her watch. "There's time to do some shopping. I have this sick urge to do something domestic and I want to work it out of my system. Catch you later."

I'd had other plans for the afternoon, but this was her vacation. If Nancy wanted to be alone for a while, it wouldn't kill me. For a while. I went to the apartment's terminal, logged on, and accessed the data I had stored at the UN.

I'd collected a lot of data on cometary life, and a lot of it was 'way beyond my comprehension. I'd expected that. I know next to nothing about cryonic chemistry; when I was in college, my instructors all taught me that chemical reactions are impossible without a certain amount of energy. No one had discussed the possibility of finding biochemical reactions in liquid helium, for the reason that it was "obviously" too cold.

But matter behaves oddly at temperatures near absolute zero, obeying quantum-mechanical laws which are masked by higher temperatures. Chemical bonds can form and break without absorbing or releasing much energy. Reactions can proceed without the catalysts needed at normal temperatures. Molecules can float in liquid helium, which is chemically inert. Where chemistry is possible, so is biology.

It is a transformed biology, following rules which at first glance have nothing to do with biology as we know it. While my work at the comet had been rushed, I had collected enough data to give me a tantalizing glimpse of interstellar life.

The magnetic-resonance imager had collected images of individual cells, in fine, three-dimensional detail. Some of the sights were easy to understand; the cell nuclei, which contain the DNA, were prominent, and roughly the same size as the nuclei in normal cells. That made sense if you assumed it took as much genetic information to make a cryonic animal as it did to make its planetary counterpart.

The cell structure? That varies from world to world, and there are variations on most worlds; look at the differences between plant and animal cells on Earth. On the other hand, all life forms are made up of cells, and cells all have the same basic functions: reproduce, form the structure of the organism, ingest matter and energy, excrete waste products, respond to stimuli.

These cryonic cells did the same things, of course. But I didn't understand their chemistry, which meant I had damned little chance of unraveling their functions. Well, nobody said I could discover the secret of life in one afternoon.

Or even one lifetime.

The door banged open late in the evening, and I nearly jumped out of my skin. What now? I wondered, until I realized it was Nancy. "Are you going

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to help me with the groceries?" she called.

"Sure." I joined her in the kitchenette, where a pair of shopping carts floated by the counter. Nancy was holding something that looked like a dead poodle. "What's that?"

"A wig. No one recognizes me with hair." She tossed it aside and started unloading groceries and utensils. "What did you do while I was out?"

"I worked." I started putting things away. Nancy's shopping had been thorough and efficient, and we had everything a well-stocked kitchen should have. "I went over the data we collected at the comet. Give me a few days and I'll be able to tell how far cryonic biology parallels ours, at least in some areas."

"That sounds good," she said. "Where do you go from there?"

"I don't know. With any luck, we'll have enough info to make some deductions about the Nomads's life cycle. How long they live, how much they eat, how quickly they reproduce. Things like that."

"That could be useful."

"Maybe. Trouble is, we might be tempted to read too much into what we learn." I held up a ham slice. "Take food. Humans can eat ham, but could you guess, sight unseen, that some humans won't touch pork?"

Nancy looked thoughtful. "So understanding Nomad physiology might mislead us."

"Exactly." I took the last bag out of a cart. "Describe the kya as 'herd creatures' and some people automatically think of Texas longhorns. You have to realize that all facts have limits. Go beyond their limits and facts turn into nonsense."

"That happens in sociology, too. You boys can go home now," she told the shopping carts. Their repulsors came on and they headed for the door. Nancy held up a frying pan and looked at me. "Speaking of facts, can you cook?"

The next morning we went out for breakfast. I can cook, sort of, if you're not fussy and not too interested in your health. For the past five years my meals have been prepared for me in cafeterias and mess halls; I used to be a passable bachelor chef, but that skill faded long ago. Nancy was no better. She had been on the move since she graduated from college—the UN always had work for a brilliant trouble-shooter—and she never had the time and stability to learn about cooking.

After breakfast we split up and went shopping. I needed new clothes; everything I had went into one suitcase, and all of it was out of style by five years. I've never cared much for fashion, but now I wanted to look my best for Nancy.

Fashion. Cloaks and capes were coming into style, and kya cuts and patterns dominated the market. I hadn't realized it before, but when I walked out of the tailor's shop I noticed how many people had picked up on the style. I had lived so long on Kya that my eye had grown accustomed to the look, until it had become effectively invisible.

My new suit felt warm, which puzzled me. It took me a while to recall that I'd had the robotailor use wool. I hadn't thought about it, but my subconscious was preparing for a deep freeze.

Despite the packages under both arms,

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I made another stop before heading home. Nancy had got home ahead of me, and she was in the main room, sitting in front of the terminal. "You've been busy," she said, clicking it off. "Did you have fun?"

"Yeah. Give me a minute." I went into the bedroom and put my new clothes away, then came back with her wedding present.

Headphones. The set had over one hundred thousand classical and neoclassical works in its memory, and it was controlled by naming a composer, one of his works, and—if you were an aficionado—a specific performance.

Nancy loved it.

"We're having guests tonight," she told me later. We were in the kitchenette, scratching our heads over a recipe for Veal Parmesan. "Vse wants to talk about the expedition, and she said she's bringing a friend, a mathematician named Zhuik."

A mathematician? That sounded harmless enough. I doubted that Resolution 1453 covered mathematics—not that I know a whole lot about math, beyond statistics and a few other disciplines used to analyze biological problems. I didn't want to give Wilkes and her cronies an excuse to jail me.

Dinner was somewhere between edible and tolerable, which was an improvement over last night. We had just finished when the doorbell announced our guests. Nancy answered it, and Vse and Zhuik came in.

Zhuik was the biggest kya I'd ever seen, a crouching mountain, Mount Everest with splayed feet. As we traded bows I found myself wondering if he had ever played bagdrag, the favorite kya sport. Zhuik was big enough to have been his own team, and his muzzle had a lopsidedness which suggested it had been banged up in a scrimmage.

This may have been his first social call on humans. He was sniffing quietly and rapidly as he came in, and his eyes looked as if he was trying to see everything at once.

"I've been looking at the data," Vse said as we settled down. "Having checked only one comet, I have to wonder if we have enough information to conclude anything."

"Good question," I said. "I think it's safe to assume what we found is typical—the odds are against us having found an atypical comet at random."

"Yes. Well—I have noted one odd thing," Vse said. "The comet had a relatively large biomass. The comet being small, was this a stable ecology? It seems things would get unbalanced with ease."

"I don't know." I thought it over. "The ecology looked diverse; it *could* be stable and self-sustaining over the long term. To prove that it is, we'd have to establish nature and types of resources, number of species, reproductive rates, lifespans, food cycles, symbioses —"

"Can all that be done?" Vse asked.

"I think we have enough data for some estimates. From what I've seen, it's safe to guess that cryonic life follows the same empirical laws as planetary life." What else could I say? "If I'm wrong, we'll find out soon enough."

"You must assume this ecology to be stable," Zhuik said to Vse. "Unless being recently established, any imbal-

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ances would have shown long ago and overwhelmed it. It must have remarkable resistance against exponential growth."

"Not necessarily," I said. "We're talking about one comet, when we know there are trillions or quadrillions of comets in the galaxy. We can assume that there's some form of contact among them."

Vse nodded. "Otherwise life would have to evolve separately on all comets. Being an absurd assumption, we can discard it."

"Why is it absurd?" Nancy asked.

"Too improbable," Zhuik said. "In addition, the Nomads can travel between comets. Less developed forms should have the same ability."

"So they could spread," Nancy mused. "But not too fast."

"True," Zhuik said. "Then again, if life evolved on only one out of a billion comets, there would still be thousands, millions of life-sources. John, I believe you were going to say that, with life overflowing on one comet, the excess could spread to others, keeping the local population down?"

"Something like that." Some people have trouble learning a language through hypnolessons, and Zhuik sounded like one of them. "One comet isn't a separate environment, like a planet; it's a fragment of an ecosystem which contains every comet in space."

"Like an oasis in a desert," Vse said. "Being winged, birds and some insects can travel from oasis to oasis. And—your camel can do the same, can't it?"

"Yes, it can," I said. "I suppose we could describe the cometary ecosystem as an analog of a desert biome."

"Complete with Bedouins," Nancy said. "Maybe that's why the Nomads migrate—to keep from exhausting their oases."

"A distinct possibility," Vse agreed.

"That assumes they don't have the equivalent of agriculture," I said.

"Maybe they don't," Nancy said. She sighed. "We know so little about them—hell." The phone was ringing. "I'll get it."

The call didn't last long. Nancy had just enough time to say "No . . . no, I haven't . . . why should I?" Then she hung up.

"What's going on?" I asked.

"That was Wilkes." Nancy went over to the cube. "She asked me to listen to the news. Something must be up."

Our multi had access to almost three hundred vid channels, but neither of us knew which ones were the news channels. "That brainless wonder could've *told* me what it is," Nancy grumbled.

"It doesn't much matter," I said. "You're on vacation, remember?"

"I still don't like having my cage rattled—huh? Playback." she told the cube.

They call it a boob cube because it isn't too bright. Nancy fumed while the machine played back the past two minutes of channel 144's broadcast: a soap commercial, a sitcom commercial, a paid political message, a rental-agency commercial, and no way to fast-forward through the slop—

A breathless blonde appeared in a TV newsroom setting. "World coming to an end," she announced. "Film at eleven."

I hit the cube's *off* key. This could

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mean only one thing: the news media had learned about the Nomads. "Someone talked," I said bitterly.

"It looks that way," Nancy said. She slouched bonelessly in a padded chair. "Well, I can't say I'm too terribly upset."

"Really?" I snorted. "How do you think people are going to handle this?"

"Pretty well," Nancy said. "I never did believe that horseshit about keeping the truth from people for their own good. Mostly it's for the government's own good."

Vse saw it from another angle. "You were called for a reason. How will this affect you?"

"It won't. I'm taking a well-deserved vacation." Her eyes drooped half-shut. "*Nothing* is getting me out of here."

I was glad to hear that—until I remembered that she had once told me she was always up to something else.

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For the next week the emergency was the only thing in the news. All the details were in the open: Correy III, Mercury, Pluto, the ambush at the comet. This wasn't just a leak; someone had dynamited the dam and half the UN was washed away. There were more resignations than during the Kya Crisis.

I don't know much about politics, but I could see that someone had provoked this crisis as part of a power struggle. I hoped the blabbermouth got flooded out with the other politicians, because while there was no panic, you could see people's nerves stretch just by watching the faces around you. That's a high price to pay to advance somebody's political fortunes.

The UN's bland attempts at reassuring the public did no good. The truth was only marginally better: we had tried to communicate with the Nomads, who didn't give a hoot in hell about our objections. The Nomads had exterminated the population of Correy III when that world annoyed them. They were likely to do the same to us if we didn't do exactly as they wished, but try telling that to people.

Back on Pluto, Tombaugh Base was still trying to talk with its visitors. The Nomads had nothing to say, however, and wasted no words proving it. That was probably just as well, considering the idiocies current at the UN.

I tried to keep it out of my mind. Vse and I were busy with our data, doing our damnedest to make sense of cryonic biology. We were doing it, too, figuring out how rapidly cells divided, which organisms ate what (and one another), and what factors limited the biomass of an individual comet.

Vse and I worked in the kya legation, a building two blocks down the street from the UN headquarters. We used Vse's private office, a small room done up in a plush, restful style that reminded me of Eldest Watcher Gavu's office on Kya. We spent much of our time huddled over my portable computer.

Things took shape quickly enough; cryobiology was a lot more straightforward than I'd dared hope. Food chains and reproductive cycles made good matches with their planetary counterparts. Sexual reproduction was the norm between the stars, and various organisms fed on one another. The Nomads seemed able to eat almost anything they found, although unlike most cryoorgan-

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isms they could not feed directly on cometary material.

"One more thing is certain," Vse said one evening. "The Nomads metabolize much more rapidly than the lower forms, by a factor of at least ten thousand."

"I can't argue with that," I said. The little buggers we'd found at the comet were slow. They drifted above the comet's surface, or they crept along its ice, while the Nomads moved as fast as—well, as me. I'd briefly scanned the monster that had shot me, and the data I'd collected hinted at a much more active metabolism. "It looks like the Nomads are as different from other cryonic life as animals are from plants."

"That may be the correct analogy," Vse said. "One branch of cryonic life evolved into a highly mobile form —perhaps several such forms. Speed is useful when one must catch dinner."

"And the Nomads evolved from a predator?"

"Not as you mean it. What is a predator?" She snuffled. "Being herbivorous, a plant would call *me* a predator! 'Grazer' may be a better term. Nomads graze on lesser cryonic life."

I'd just hit on another basic difference between human and kya attitudes. My first thought had been of a predator, something that comes charging out of nowhere, drags its victim back to its cave and eats it—the sort of thing my paleolithic ancestors did. Vse thought in terms of grass-nibbling and leaf-munching.

I decided she was more nearly right than I was. Most of the cryonic life was mobile, like the life in Earth's oceans—and Kya's, and Wells IV's, and several other waterworlds. "It's like a whale feeding on krill," I reflected, "or a shrimp eating plankton."

"I agree. But you see the imbalance this creates?"

I saw it, all right—and then some.

The faster your metabolism, the more energy input you need—food, sunlight, whatever. Cryonic biochemistry used precious little energy, but these liquid-helium boogers still needed *some* energy. They made the most of what energy there was between stars, soaking up every erg the way a cactus hoards water. The Nomads extracted energy from other organisms by eating them—a *lot* of them, to cover their greater needs. By cryonic standards the Nomads had to be voracious. And if you're too voracious—

Back in Oklahoma, people still talk about the Dust Bowl of a century ago. Farmers overworked the land, mismanaging it and trying to grow more food than it could produce—a situation exacerbated by an intense drought. Topsoil turned into dust and blew away in enormous clouds, and local agriculture was a long time recovering.

A lot of folks had to leave the state, to look for work and food. People called them Okies. . . .

I outlined that to Vse. "Overgrazing," she said. "We keep dairy cattle. Being greedy, some herders allow their cattle to eat all the grasses in an area. The fields do not soon recover from this denuding."

"This could explain why the Nomads migrate," I said. "The cryonic ecology may not be efficient enough to supply all the food they need, not if they stay

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in one place. I wonder if they eat everything in sight before they move on?"

"Possibly," Vse said. She looked thoughtful. "Would you like to bet that it takes a comet fifty megayears to recover from a Nomad feeding? That would explain the timing of their return to this part of space."

"And of their whole migratory cycle . . . but it's going to involve some heavy-duty math. There are a lot of variables and uncertainties."

"I happen to know a good mathematician. Why don't I discuss this with him?" Vse sounded so eager that I had to fight down a smile. She had latched onto Zhuik for reasons that had little to do with his mathematical talents—which were considerable, by the way. The kya over-government knew that math is the basis of all science, and they'd sent their best mathematician to probe at our secrets.

Well, I had a good reason to knock off early, too. I said good-bye and went home to Nancy.

The traffic wasn't too bad, and I was home ten minutes after I left the legation. I found Nancy sitting on the couch, headphones clamped to her ears. "What's the latest?" I asked, sitting down with her.

She took off the headphones. "The kya got a death threat today."

I went slack-jawed at the thought. Who on earth would want to hurt them? And why? "Tell me."

"It was on the news this morning," she said. "Maybe it was a crank thing, but the way the reporter sounded—" Nancy shook her head. "I called Mrih and told him to take it seriously."

"Did he?"

"I think the dumbshit got it through his thick skull that there might be trouble. UN security and the secret service will step up their watches, but the kya will be better off if they have their own eyes and noses open."

"It might be a good idea to call Vse," I said. "Mrih didn't tell her while I was there. Hell, I didn't hear anything about this."

"Mrih and his damned games." Nancy got up and went to the kitchen phone.

We had bought a new cube to replace the clunker that came with the multi. I told it to get me a newscast, search topic kya. The cube did whatever it is cubes do, and after a few seconds it presented me with a news excerpt.

What was it? Oh, nothing much. Just a news anchor, remarking that an unidentified man had sworn to kill a kya a day until the threat to Earth was over.

Just a promise to commit mass murder, and it was only a minor item on the news; no mention was made of an arrest or investigation. Maybe the Nomad threat had turned everything else into trivia . . . but the man's eyes disturbed me. He looked as if he approved.

The cube was smarter than I'd thought. It came up with a second item about the kya, a roundtable with the usual acidic host and antagonistic guests. "Everything was all right before the kya turned up," one of them said. "Why do we put up with them? Space used to be ours. We paid trillions of dollars to get it. Why do we have to share it with all sorts of wankers?"

The guy was as loopy as a coil of rope, but nobody called him out. I zapped through the entire show, and found that they were discussing what to

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do about the Nomads. They all had a vague notion that the kya and the Nomads were one and the same—they were aliens, weren't they? And all of them were angry about the danger posed by aliens.

Two bits of trivia aren't enough to establish a theory, but I felt worried. Most people like the kya—but there are exceptions, and now they were coming out of the shadows and not being slapped down.

Nancy finished her call and rejoined me on the couch. "Mrih didn't tell anyone," she said angrily. "The idiot. He must be praying for an incident."

"Why—oh." It would be hard on any kya who got caught, but a diplomatic incident would give Mrih some leverage at the UN. When it came to politics, Mrih played rough. "At least everyone knows now."

"Vse will tell everyone," she agreed. "But she shouldn't have to. *Mrih* shouldn't have to. Damn it, this shouldn't be *happening*."

"Maybe it's nothing." I put an arm around her and pulled her close. "People are upset. Once things settle down they'll forget about these cranks."

"They won't," she said. "The longer this crap goes on, the harder it'll be for us to get over it. And the kya will remember this long after we've forgotten it—hell." The phone was ringing. "Who is it?"

The junk in the cube turned into Carl Dowling's head and shoulders. "Nancy? I'm sending some people over to consult you."

"Is it important?" I asked.

"Well—" He looked us over. "They want advice on our visitors."

"We'll be here, Mr. D.," Nancy said. She disentangled herself from me. "How's the project going?"

"Rocky, but we'll meet the deadline." He sighed. "It would be easier if you were back at the UN, running interference for me."

"Forget it," I told Dowling, before Nancy could speak. "She needs a rest. She won't do anyone any good if she burns out."

"John's right," Nancy said reluctantly. "But I'll see your people."

"Well—OK." His image vanished.

"He expects too much," I said.

"Not really," Nancy said. "Mr. D. thinks everyone can give as much as he does, if they just put their minds to it. That's how he got where he is. Well, we'd better get ready." She called out the cleaning robots and set them to work.

Dowling wasted no time; fifteen minutes after he hung up the doorbell rang and told us we had a pair of visitors. The machine identified them as Kosugi Hideki and Greg Thayer.

I felt odd at meeting Thayer again. We had worked at the Kya base, and we had been rivals for the same woman's affection. . . . ages ago, it seemed. Or—had he even been aware of my interest in Aelita Krupskaya? My memories of our non-romance had gone hazy. I couldn't even remember what Aelita looked like.

Kosugi looked as Japanese as a Shinto shrine, complete with a black business kimono and obi, but he took coffee instead of tea when the tray rolled around to him. "We have been asked to negotiate with the Nomads," he said.

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"Mister Dowling advised us to consult you."

"Truth is," Thayer said to Nancy, "the old boy told us to do whatever you said." Thayer's tone suggested he had doubts about Dowling's intelligence and sanity, and his ancestry to boot. That was understandable; the last time he'd seen Nancy, she had been an unholy terror.

Come to think of it, she hadn't changed much.

Nancy took it in stride. " 'Negotiate,' " she repeated. "What have we got to offer the Nomads?"

"Military knowledge," Kosugi said crisply. "Strategy, tactics, experience. Analyses have been done by military experts—*true* experts, not the figureheads of the general staff. In addition we are arming all available spacecraft, which will give us palpable aid to offer the Bolds."

"And this is a way to pump the buggers for information," Thayer went on. "We'll put a few things on the table and see what interests them. Their responses will tell us a lot."

"I tried that at Pluto," Nancy said. "They saw through it right away."

Thayer looked at his nails. "Yes, well, I *am* a trained sociologist, with no small experience among aliens—"

"Same here," Nancy said. "I got my Ph.D. at Harvard, class of '29. Dr. Thayer, the Nomads have had megayears to hone their negotiating skills—they were cutting deals while our evolutionary ancestors were dodging dinosaurs. They won't reveal anything they don't want us to know. And considering their arrogance, I don't think they'll want help from us."

"Especially the Nomads that attacked *Aurora*," I added. "You'll get yourselves killed if you mess with them. They don't talk."

Kosugi looked smug. "We will not repeat the errors you made. Our experts have identified a course of action which will let us communicate with the Bolds."

"Are any of these 'experts' coming along?" Nancy asked. She held up a hand. "No, of course not. They decided their own presence wasn't required—right? They'll find out they goofed when you don't come home."

Thayer faced Kosugi. "She's always had contempt for authority. You should have seen her on Kya."

"Sometimes authority begs for contempt," Nancy said. "Prove it to yourself. Find the idiot who thought of this deal. Tell him you won't go unless he comes along—"

"*I* command the negotiation team," Kosugi said. "I know the mission. A senior official is not required."

"Kosugi Hideki," Nancy said, more to herself than to him. "Graduated Kyoto Institute for international studies three years ago. Junior assistant to the Kurile Islands Treaty negotiators, attaché to the Japanese embassy in Taibei, special advisor to Delegate Konda." And, I added to myself, he wasn't going to pass up this chance to advance his career.

Kosugi nodded sardonically. "My fame precedes me."

"I try to stay informed," Nancy said. "You're pretty junior. You'd better ask yourself why they picked you for this job."

"You yourself are quite junior for the tasks you have undertaken." Kosugi

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stood up, and Thayer rose to his feet a few seconds later. "I thank you for your advice," Kosugi added, his voice filled with irony.

"Charmed," Nancy said, slouching down in her chair. "But I have one more bit of advice for you. Write your will."

I followed them out the door. "Dowling told you to see Nancy," I said as we walked toward the hall elevator. "You can't imagine he'd give you bad advice."

Kosugi nodded. "We are here out of respect for Mr. Dowling. It would have been discourteous to spurn his counsel after seeking it. But beyond that . . . " He waved a hand in casual dismissal.

"Listen," I said. "Most of Nancy's jobs have been bush-league stuff. That includes Kya. As for the trip to Correy III—the UN was trying to discredit her. Ask around. The Security Council isn't above using its juniors as pawns."

"What, with the future of humanity at stake?" Thayer asked.

"Who leaked the word about the Nomads and Correy III?" I asked him. "Someone is gambling, and they're staking our world."

"Humanity is already at risk," Kosugi said.

"It is." The elevator opened and I entered it with them. "If we have to gamble with these stakes, we'd better play it conservative. We can't even guess the odds here—or the outcome. Suppose the renegade Nomads decide to wipe out humanity?"

"I am cognizant of O'Donough's arguments," Kosugi said. The elevator surged toward the roof. "She is wrong. Do I need to point out that she has few facts to support her? And such facts as she has are open to several interpretations?"

He had a point—but I'd take Nancy's views over the UN's.

The elevator let us out onto the roof. It was dark, even here in New York; people were conserving power against next month. Kosugi walked toward a limo, ostentatiously ignoring me. I decided to work on Thayer. "When do you leave?"

"In twelve days," he said. "Maybe sooner. It depends on how soon they finish arming the *Edward E. Smith*."

"How are you going to open your talks?" I asked. "With a show of force?"

"The Bolds respect force," Thayer said. "That's our most probable interpretation. They're a barbaric society with an utter contempt for pacifists. It's an inevitable response to the mainstream Nomad culture. . . . and the Bolds are going to overwhelm the mainstream." He sighed. "No culture is stable."

"You're sure?" I asked him.

"I wish I was wrong, but sociology is a science, not wishful thinking. There are equations that predict events, tell you how and why a society will fall and what will replace it. A rich, peaceful trading culture, one that quakes at its own shadow and destroys the least threat—that's the main Nomad society."

"You're saying they're decadent."

"And rich. That makes them a tempting target for anyone who decides robbery is easier than work, including its own members." Thayer gestured at the elevator door. "Ask *her*. Harvard doesn't graduate idiots, but she's as prone to wishful thinking as the rest of us."

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"I'll ask her," I said.

"Do that," he muttered. Then, after a pause, "You really married *her?*"

I nodded.

"Who'd have thought?" he said. "Baxter, what do you see in *her?*"

"Plenty." I felt stung by his tone. "She's—different. She's *always* different, always a surprise, and things are never dull around her. And there's a lot of love in her. She couldn't do the things she's done if there wasn't," I added wonderingly. Nancy had done her best for the human race, but she had gained nothing by her actions and she had endured enormous hostility. Nancy must have been sustained by something more powerful than ambition.

I don't think Thayer heard me. "Women," he said.

The way he said the word should have stopped me—but something in me had to *know*. There was a loose end in my life; I needed to know what had become of Aelita. I'm not proud of that need, but I couldn't control it. "How is Aelita?"

Thayer looked cool in the dim light. "That's right, you liked her. We got divorced."

"I'm sorry."

"Don't be." He kicked at the decking. "The *Ley*'s skipper married us the day we left Kya. We got divorced the day we got home. It was like we turned into different people after we got married." He spat a curse and joined Kosugi in their car.

Different people, I thought as the car took off. We had all been different people on Kya, our personalities warped by life on the base. Leaving the base had brought more changes, a swing back to normality, and when it ended Thayer woke up one morning and found himself in bed with a stranger.

Nancy was on the phone when I came back to our multi. I waited silently while she talked with someone. "That was a friend of mine at NASA," she said after she hung up. "She has enough sense not to play along with this lunacy, and she'll warn other astronauts about it. Maybe we can stop this." Then she looked at me. "Something's wrong," she stated.

"Yeah." I sat down and repeated what Thayer had told me. "It's possible, isn't it? Nomad civilization is rotting away, and the barbarians are taking over."

She was scowling. "It's possible. It's a hell of a coincidence if it's starting now, so close to Earth, but it *is* possible."

"And it explains why the UN wants to side with the outlaws," I said. "They think they've spotted the start of some vast historical trend, and they're going along with it to save the human race."

"Yeah, the logic is obvious. But even if it's right, so what?"

"What?"

"I said, so what?" Nancy got up and went to the window, to look at a scattering of stars in the black sky. Her voice was tight with anger. "The UN wants to side with the winning team, and they don't give a rat's ass if they're barbarians."

"They're talking about human survival—"

"Bullshit!" she flared. "If we collaborate with barbarians, how long will it be before we turn into savages? You lie down with dogs, John, and you get

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up with rabies. What kind of survival is *that?*''

''They're scared.''

''They're scared of their own illusions.'' She turned away from the window. ''I'm scared of them not opening their eyes. I *know* why Thayer's wrong, John, and why the UN's wrong.''

''Tell me.''

''They assume that the Nomad society has to go through a cycle of collapses and rebirths, just like humanity does.''

''It's a safe assumption, isn't it?'' I asked. ''I mean, you assume that the Nomads are enough like us so that basic sociology applies to them as well as it does to us.''

''Why, so I do.'' Nancy smiled wolfishly. ''But everything we know about sociology is based on observing humans and kya. I assume the Nomads obey the laws of sociology, just like they obey the laws of physics and biology—but I also assume they know a few laws that we don't. Their society must have stability mechanisms that we don't understand—*yet*. That means the Nomad culture *isn't* falling like the Roman Empire. They *will* beat the outlaws.''

''Can you prove they're stable?'' I asked.

''Almost—which doesn't count.'' Nancy sighed. ''It looks obvious, doesn't it? The Nomads have been around for millions of years.''

''True,'' I said. ''At least, they buried a vault on Earth fifty million years ago, and they're doing business the way they did back then. But—''

''Exactly,'' Nancy said. ''But what happened between then and now? Nomadic culture *could* have gone through a thousand cycles of collapse and renaissance.''

''So there's no obvious link.'' There are civilizations in Egypt and England, but they aren't the ones who built the Sphinx and Stonehenge. Local patriots may claim them as their own, but that doesn't create a continuity stretching across the ages. These Nomads might have nothing in common with the Nomads who left the vaults on Earth, Kya, and Correy III.

''There *is* a link,'' Nancy said. ''We just haven't recognized it yet. We're overlooking some factor about Nomad culture that has kept their civilization alive and healthy for megayears. I don't know what it is, but I *know* it's there. We'll find it.''

''What happens when you do?'' I asked. ''The UN still won't listen to you.''

''They will.'' Her voice was flat and earnest. ''I'll see to it.''

13

There was trouble, but it never made the news. A riot broke out at the Kennedy Space Center. Demonstrators occupied the Orbidyne offices, demanding that the Mercury power collector not be built. Looters broke into a warehouse on Staten Island and cleaned out the stocks of winter clothing. A preacher in Virginia calculated that the Crucifixion had happened exactly two thousand years ago, which somehow meant it was now time for the Battle of Armageddon. His followers gave him all their worldly goods, paraded around in white robes, and petitioned the federal and UN governments to wage a holy war against all aliens.

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I heard all that second-hand, from folks who claimed to have seen those things. If you could believe the news, people were facing the impending disaster with a spirit not seen since the London Blitz. Censorship had gone into effect, and everything unpleasant had vanished.

"We've disappeared from the news, too," Vse told me one afternoon. We were in the kya legation's kitchen, where she was fixing herself a cheese-and-stripleaf sandwich. "I have to wonder if that's good or bad."

"We call it 'keeping a low profile,' " I said. "It's a good idea not to attract attention when you're getting death threats."

"Perhaps . . . but I feel we are being hidden. *Things* can happen to you while you're hidden."

"You're not hidden," I said. "The UN has put extra guards and security gear around the legation."

"To keep attackers out . . . or us in?" She bit into her sandwich. "We should get back to work."

"Right." As we headed upstairs it occurred to me that Vse sounded a touch paranoid. It was justified, but it wasn't like her to worry about her safety. Confinement wore at her; in the face of assorted threats the kya had decided to stay inside the legation. A week of incarceration and near-isolation was giving Vse cabin fever.

Zhuik was in Vse's office, standing where we had left him, his eyes fixed on the computer. He spoke in kya as we came in. "Being so, it is a solution, but it becomes meaningless if there is a more elegant solution."

"You have something?" Vse asked.

Zhuik gronked in surprise. "When did you come in?"

"Just now." She offered him a bite of her sandwich, and half of it disappeared. Vse had told me that Zhuik *had* played bagdrag in college—he'd been the kya version of a Rhodes scholar—and he had an athlete's appetite. "What have you found?"

"Limits on the Nomad population." He turned the computer so its viewer faced us. "Being so, you see?"

I looked at it. To save my life I could not have told if the symbols came from human or kya mathematics, or a kindergarten art class. It was my good luck that Zhuik wanted to impress Vse with his findings. "I've proven that the galaxy can only support ten billion Nomads. Cryobiology being what it is, it *does* take fifty megayears for a comet to recover from a Nomadic grazing. Slow! The Nomadic metabolism being calculated, and the number of comets in the galaxy being estimated, ten billion is the upper limit on the Nomads's galactic population."

"That's also the size of their swarm," I said, recalling the data from the Correy III vault.

"Yes," Zhuik said. "They live right at the upper limit. Risky! Following a population explosion, it would take the galactic ecology one hundred to five hundred megayears to recover."

I grasped the key fact at once. "Then their population has been stable for the past fifty megayears."

"And longer," Zhuik agreed. "That is inescapable. Had they ever exceeded the upper limit, they would have wrecked the interstellar environment and consequently suffered a famine."

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"Followed by a population implosion," Vse said. "Seeing no sign of such a catastrophe, it becomes clear that the Nomads have always used some form of population control, without fail."

"I agree." We had speculated about the Nomad population weeks ago, while we were at the comet. Back then we had only been kicking around ideas, but now we had facts to support our ideas—and more. "Nancy has to know about this."

I relayed the data to my home computer. I tried to call Nancy, but she didn't answer the phone; she was either out or busy. I left the legation and headed home.

My cab parked on the roof just as a trio of women in business dresses took off in their own car, a machine with UN plates. They had that mid-level look that most bureaucrats develop: department heads, I guessed, or something similar, giving orders to large staffs and taking orders from the layers of officials above them. Lately Nancy had had quite a few guests like them. They looked unsettled by whatever Nancy had said to them.

What was she up to? I could have asked, but I wanted to figure things out by myself. One thing was certain: her leave of absence had a political dimension. She wanted to dissociate herself from whatever the UN did, while maintaining her unofficial contacts. Once the Nomad Crisis was over, she would be in an excellent political position.

Was she angling for Wilkes's job? I didn't think so. There was too much bad blood between her and the UN leadership. The way they saw it, she was some upstart with no business in diplomacy or politics. Nancy had enough sense not to buck that.

I went inside and found Nancy sitting in the main room, headphones on her ears and a blissful look on her face. One eye opened and fixed on me. "What's new, John?"

"I've just had a revelation," I told her, and sketched out Zhuik's findings. Nancy sat upright, her face intent.

She settled back into her chair after I finished. "Proof," she said at last. "Confirmation. Let's go see Wilkes."

We went to the roof, paged a cab and headed for the UN. "What have you got in mind?" I asked as the cab took off.

"About what you'd expect," she said. "I'm going to talk to Wilkes. What happens after that depends on what she thinks."

"In other words, you're going to wing it."

"Probably." Her hand brushed her bare scalp, as if to remind me she was good at improvisation. "I think she has enough sense, and enough self-interest, to cooperate. You don't get as far as she has by being stupid."

"I wonder," I said darkly. "All she's done so far is play politics. That's all anyone's done."

"Including me," Nancy said placidly.

"You're different."

"That's only because I'm right and they're wrong—this time."

The cab parked itself atop the Secretariat Building and we went inside. We didn't have an appointment, but we got into Wilkes's private office as easily as a rat gets into a trap. "I've considered having you two arrested," she said as we sat down.

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"On what charges?" I asked.

Nancy answered for her. "Section five-eighty-seven, paragraph B of the UN Code of Military Justice. Incitement to mutiny, a state of emergency having been declared."

"I'm glad you're not pleading ignorance of the law," Wilkes said. "The Peacekeeping Forces have impressed every available ship into military service. They're armed now—but there's trouble with the crews. They won't follow orders."

Translation: astronauts have more sense than politicians. "What about Kosugi's mission?" Nancy asked.

"Half of his staff backed out the other day," Wilkes answered. "I wish I could indict you over that. You convinced them they were going on a suicide mission—not that the *Smith*'s crew was going to go, not after what you told them. You've wrecked our plans."

"Good," Nancy said. She studied Wilkes through slitted eyes. "You'd better know why I've been such a pain in the ass. Then you can decide what to do next."

"I already know—"

"No, you don't." Nancy nudged my elbow. "John, tell her about the Nomads's population."

I took my cue. "Their population has been steady for the past fifty megayears. They've numbered ten billion through all that time—maybe less at times, but never more. During that time they've never had a population explosion, even though there *is* a potential for that."

"Can you prove this?" she asked me.

I nodded. "The math is complicated—"

"Spare me." She looked to Nancy. "Does any of this have a point?"

"The point is that the Nomads have been using population control since day one," Nancy said. "That means they *must* have had a stable civilization all along, because if the control slipped even once they'd overpopulate the Galaxy. As John can tell you, even a small population explosion would be a disaster for them."

"This is a very slender thread of logic," Wilkes said.

"It is," I admitted. "But it's *right*. It's as right as using the law of gravity to predict what happens when you jump off a cliff. And it means—"

"This means that our analysis—the 'Bolds' and 'Timids' concept—is wrong." Wilkes looked angry—which was a good sign. No one with any brains feels pleased to admit they've made a major error of judgment. She looked at Nancy for a long moment, then let out a sigh. "You have a plan. Talk."

"Simple. Order the fleet to stay in near-Earth orbit and defend the planet itself, in case the outlaws attack."

Wilkes clenched a hand into a fist, digging her nails into the palm. "I've already considered that option. The Security Council still wants to order offensive operations, if conditions warrant."

"That will cause open mutiny," Nancy said. "So persuade them to order the fleet to stick close to home—they won't do anything else anyway—"

"Thanks to you!"

"—and those orders will reassure the public. They're getting panicky, and once this mess is over that will make

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it politically difficult to deal with the Nomads—''

''What makes you think we'll want to do business with them?'' Wilkes demanded.

''Human nature,'' Nancy said. ''We'll do business with anyone, if it's to our advantage.''

''And if you're right.'' Her face was flushed with anger.

''I'm right,'' Nancy said. ''Here's a prediction: the Nomads *will* defeat the outlaws, and they'll do it *without* wrecking Earth.'' When Wilkes raised an eyebrow she continued, ''The Nomad civilization has been around a long time. They must have had problems like this before, so they know how to handle them. And it would be wasteful of them to wreck Earth, so they'll pull this off without causing us too much hardship.''

Wilkes looked unimpressed. ''A nice prediction. If you've guessed right, you come out looking good. If you're wrong, we'll all die and you won't be called to account.''

''I'm not wrong,'' Nancy said.

''Then you won't mind if I have a few experts call on you and check your ideas.'' She picked up one of the manila folders on her desk. ''I've given you all the time I can spare.''

''Did that help anything?'' I wondered, after we left Wilkes's office. I wasn't looking forward to a visit from her ''experts.'' At the very least it meant endless days of explaining the obvious to people who wanted to prove us wrong.

''It helped,'' Nancy assured me. She smiled tightly. ''Wilkes will do what I suggested.''

''And then she'll take credit for your suggestions.'' We got into an elevator and we started down. ''She'll end up smelling like a rose, not that she'll be grateful.''

Nancy snickered. ''I don't want her gratitude. I want to get Earth out of this mess. This is the way to do it. But to hell with it for now. Let's play tourist for a while. Any thoughts, Mr. O'Donough?''

''Let's see Greenwich Village,'' I suggested. ''I've always wondered if it's as corrupt as my folks claimed it was.''

''OK, country boy.'' The elevator opened and we walked out into the lobby. There were scores of tourists looking at the displays—a Moon rock brought back by some early astronauts, a model of the first Earth satellite and the first starship, globes of the colony worlds, a plate from a Nomad vault. All of the exhibits were space-oriented, I noted. The member nations could have sent art treasures to fill ''the world's living room,'' but the frontier has an appeal everyone can understand—

I heard shouts, then shrieks, followed by the popping of firecrackers. I had just recognized that sound as gunfire when something red-hot slammed into my chest and killed me.

14

Coming back from the dead is a class act, but it also hurts like a son of a bitch. I have vague memories of waking up while someone—the Marquis de Sade, I think, with an able assist from Torquemada—asked me about Nancy's hair and my stay on Kya, when and where I lost my virginity and if I giggled when it happened.

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I held out as long as I could, but enough pain will make me talk about anything. Each time I sank back into oblivion I felt I had betrayed myself by talking.

Then I woke up and there was no pain, despite the tubes and wires stuck in my chest. "Welcome back," George O'Donough's voice said.

I made a rusty noise, and a tube squirted water into my dry mouth. "You've been unconscious for nine days," another voice said. I felt things slide out of my chest, and my eyes found a black and white shape above me. That turned into a man in a doctor's coat. He spoke as he removed electrodes and IV tubes from my body. "All of your injuries are healed, but you're going to feel weak for a while." He gave me some more water.

I swallowed. "Where's Nancy?" I rasped.

"She's upstairs, sleeping in a guest room," George said. "She wasn't hurt."

Thank God. "Can I see her?"

George glanced at the doctor, who nodded. "I'll send her in," he said, and left.

"How long have you been here?" I asked George.

"Not long. I got in from Washington a few hours ago. The docs said they didn't know exactly when you'd wake up, so I told Nancy I'd watch while she got some sleep."

"She's had a rough time," I said. That wasn't a brilliant deduction, but under the circumstances it was pretty good.

"Rough, yes. I had to chase some UN-types out of here and send her to bed. The UN won't bother her again; I pulled some strings and they backed off."

"Thanks," I said. My brain was coming back on-line, and I thought of something I *had* to ask. "George? What's going on between Nancy and Maya?"

"I don't know," he admitted. "There are times when I'm tempted to put Maya over my knee and wallop her fanny. Maya and Nancy—they used to be more like sisters than mother and daughter. Just seeing them together was wonderful." He looked meditative. "Things started to go sour after Nancy joined the UN."

"Doesn't Maya like the UN?" I asked. When America integrated itself into the UN, back when I was in high school, I'd heard a lot of people talk as if it was the end of the world. Burning the president in effigy was a weekly event in my home town.

George shook his head. "Maya used to do benefit concerts for the UN. She's still an honorary member of its—" he chuckled sourly "—Good Will Commission. John, I've talked with Maya about this, but she won't tell me anything."

"Nancy is like that, too," I said.

"Give her time. Sometimes my daughter has trouble opening up. She—has Nancy told you I'm not her biological father?" George returned my nod. "Society is hard on what it calls illegitimate children, especially when their parents are celebrities. I'm sure you can imagine the problems she had as a child."

"Some of them."

"She got hurt a lot, and it makes her cautious. It's the reason she's so de-

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pendent on Maya; Maya was her only defense against a lot of the pain. The funny thing is that despite everything Nancy likes people."

"She just doesn't like being an outsider," I said. Idiot, I told myself, who does? Look at what loneliness and isolation did for everyone at the Kya base.

"And she doesn't know how to get in. I've tried to help her, but I don't know what—" George stopped at the sound of voices in the corridor. "We'll talk later." He left my room.

Wonderful, I thought, just wonderful. The world's leading authority on female O'Donoughs didn't know what was wrong. I was on my own.

Nancy came in a moment later. She looked worn out, and there was a thick blonde stubble on her scalp. "Hi," she said.

"Hello." I watched her seat herself on the edge of my bed. "You're OK?"

"I am now." Her hand touched my cheek, then she bent over and kissed me. I felt something scratchy, and realized my face was covered with stubble.

"What happened?" I asked, after she pulled away from me.

"There was a man with a gun," Nancy said. "He decided the UN was to blame for the Nomad threat, so he attacked the UN."

And sprayed a bunch of tourists with bullets. The logic of madness—they were at the UN, right? "How bad was it?"

"Bad enough. Five people stayed dead. Others—" She shuddered. "They got to you before there was any permanent damage. To your brain. You test out OK."

That explained the torture sessions. The doctors had woken me to check my memories and thought processes. They can cure death, but not brain damage, and if there's too much damage they throw in the towel. Lesser amounts of brain damage are "acceptable"—unless your brain is the one under discussion.

"Everything else is all right," Nancy said. She rested a hand on my chest. "You had two shattered ribs, a collapsed lung, and a hole in your aorta. They replaced the aorta and ribs, and patched the lung. How does everything feel?"

"Tender." I raised my head and looked at the scar tissue. Drugs and neuroinductors had accelerated the healing process, but my chest still looked like a jigsaw puzzle, with the edges marked out by disinfectant.

Raising my head must have been too much effort, because I suddenly felt dizzy. I guess it was exhaustion—medically, augmented healing drains you, forcing your metabolism to work at a fever pitch.

The doctor returned and prescribed a solid meal. Nancy updated me on current events while I ate. The UN had announced that its makeshift battlefleet would stick close to Earth, to deter any Nomadic assaults. A ship had taken most of the kya home last week. Wilkes's experts had spent much of the past nine days grilling Nancy, doing their best to punch holes in her version of events.

"Wilkes should have left you alone," I grumbled.

"It was better than sitting around and sweating," she said. "Anyway, Vse and I convinced them—"

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That surprised me. "Vse? Didn't she go home?"

"She wanted to stay. Maybe she's afraid I'll welsh on our bet."

"Vse?" I chuckled. It didn't hurt when I laughed. "Sometimes I think she's just looking for kicks. What about the Nomads?"

"Two of them are still at Pluto. Our playmates haven't shown up yet. And the power collector should be finished in three—no, *two* days. That's well ahead of the deadline. The UN has pressured Mr. D. to stop, but he's out-stubborned them."

"Dowling is a good egg." I finished the white stuff on my plate, and tasted the green stuff. Hospital food—but now that I had something in my belly I felt much better. "Any idea when I can check out?"

"I'll ask."

Fifteen minutes later I was in a cab. The doctor had decided that I could rest at home just as well as in the hospital, and they needed the bed space for other casualties— "I mean patients," the doctor had corrected himself.

I looked out the window as we left the hospital. New York looked the same as ever, although—"The traffic is pretty heavy, isn't it?"

"Refugees," Nancy said. "Lots of people are leaving the inland areas for the coasts. They think it'll stay warmer on the coasts after the Nomads pull the plug."

"It will. The oceans act as a heat reservoir." They would cool slowly, keeping the air temperature above the freezing point of salt water, until the seas themselves froze.

"That assumes they do it," Nancy said. "And everyone and his brother assumes they will. So the coasts are getting crowded."

"And crazy," I mused. The doctor has said *casualties*. "What's happening?"

"The police and National Guard are keeping order," she said. "I haven't seen any riots or demonstrations, and do you really care about this?"

"Oh, absolutely," I assured her. "I want to make sure I'm not interrupted when I seduce you."

"Good. You had me worried—hell. Driver, hold and circle."

"Trouble?" I asked. I looked out the window. We were near our multi. The streets, sidewalks and roofs were packed with cars.

"Squatters," Nancy fumed. "Or DPs. The CRA has been billeting refugees everywhere. We're *supposed* to have an exemption."

I had a good idea of what all that meant. Nancy confirmed it by getting out her phone and calling our number. After a moment a man answered. "Whaddya want?" he growled. Other voices chattered in the background.

"Wrong number, you mangy pud-pounder," Nancy said, and cut him off. "Driver, take us to Catskills 753."

"What's in the Borscht Belt?" I asked.

"Dad's company has a lodge there. They call it the Tune Saloon."

"Sounds good," I said.

"It isn't," she said. "It's just the only place I know with a tough security system, and where we can get a room."

"That *is* good. I'm fed up with interruptions." I put my arm around her

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waist. "Driver, take us up to the express altitude."

"Why so high?" Nancy asked.

"Privacy." I tapped the window with my free hand. There were thousands of cars within easy viewing distance, and no way to opaque the damned windows.

" 'Privacy,' " Nancy repeated, and started undoing my shirt. "I'll try anything once."

The Tune Saloon was a pleasure palace, designed to cater to the whims, legal and otherwise, of musicians, music executives and assorted hangers-on of the music industry—excuse me, of *the* industry. As the resort staff saw it, civilization and explored space divide into those who create music, and the plebeian masses who can but listen and gape in awe.

No self-respecting sycophant wants to offend relatives of company brass, so Nancy and I weren't made to feel out of place. But between the time we left our cab and flopped down in a suite, we seemed to hear about every hell-raiser and zit-popper who ever visited the Tune Saloon. The staff weren't being snobbish; most of them were kids who honestly thought that chart-topping music formed the navel of creation, and the rest had musical ambitions. For her part Nancy treated them like reverse gears in the machinery of evolution.

Well, we all have our own standards. For twelve hours or so mine centered on a microbot-fitted bed, one which was a credit to its maker. When I awoke shortly after dawn I felt rested and ready to face any world.

The smell of fresh coffee drew me to a service panel, which offered to supply any food I could name. I ordered breakfast for two, accepted a cup of coffee, then followed the sound of running water into one of the suite's three bathrooms (Three? I could understand two, but why three?) (On second thought, I don't want to know the answer.)

Nancy was soaking in a bubblebath. Her scalp-stubble was shaved away and her crest was back in perfect alignment. And I had thought I might have seen the last of her Mohican. "I called Vse a while ago," she told me. "I invited her and what's left of the kya legation to come here for the duration. They accepted."

"New York's getting too hot for them?"

"There are still threats." Nancy shrugged, making the bubbles ripple. "There aren't as many as before, but why take chances? And with all the refugees, New York is ripe for an explosion. There've been riots in other cities."

"So they're coming out to the boondocks."

"It's not *that* bad." One arm rose from the bubbles and moved to encompass the walls. "There's a big communications center here for multi-site recording sessions. That's another reason we're here, and not among normal people."

"Yeah? Why do you need a comm center?"

"Rinse," she said. The bubbles were swiftly replaced by clear water. What lay beneath the rippling water was enough to distract any man, but she wasn't ready to change the subject. "The Nomads will talk business after they quash the outlaws. Any business they do is going to include the kya.

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They'll be here, with an accredited UN flunky—me—all ready to wheel and deal."

"And afterwards we land in jail."

"Wilkes will back me up," she said. "It's all arranged."

Trust Wilkes? "What's in it for her?"

"She takes the credit for my work, and that gets her a crack at the secretary-general's job." Nancy got out of the tub and began to towel off. "And she wants me to negotiate with the Nomads for information on how to keep our society stable. *Politically* stable," she added.

"What would the Nomads know about that?" They may have been stable themselves, but I didn't believe they could tell us anything useful. Our societies were too different.

"The Nomads deal in information," Nancy said patiently. "Think of all the worlds they've seen—different societies, with their own cultures and histories and ways of looking at things—"

"Ahhh . . . " Once mentioned, it was obvious. Given the time and talent, we can figure out all the laws of science for ourselves, and design any machinery we want. But what can we know about worlds we've never seen? How can we deduce the history and social structure of a race about which we know nothing?

We can't. But suppose the Nomads had seen a society remarkably like ours, but which had figured out a way to eliminate poverty, or crime, or war, or any other problem you care to name. They might know about blunders we'd do anything to avoid. The Nomads could give us chapter and verse, and how much is information like that worth?

That was my idea of stability, but as Nancy had said, Wilkes wanted a different kind. "There are more important things than political stability," I said in disgust.

"That's because you're not a politician. If you were, you'd know that staying in office is the most important thing there is." Nancy tried to look innocent. It didn't work. "But I have this funny feeling that the Nomads can't help. Wilkes is looking for clever political tricks that the UN can use without any trouble, but anything the Nomads suggest will include major changes to our society. I didn't mention that."

"I might have guessed," I said. "But where did Wilkes get the idea—oh. Vse suggested something like that."

"And Wilkes decided she could get better information from the Nomads. Hey, breakfast!" She wrapped the towel around herself and padded out into the main room. The panel was busy turning itself into a cozy dining nook, complete with meals. We ate in silence; Nancy seemed as hungry as I felt. She looked like she had lost weight.

Nancy made some calls after breakfast, while I stood in the shower and scrubbed the disinfectant from my chest. My brush with death hadn't made a great impression on me; it had happened too quickly for me to know what was going on, and I hadn't felt like I was dying. I couldn't recall the near-death-experience I'd always heard about—the tunnel of lights and all that—which left me vaguely dissatisfied. I was sorry to have missed it.

Well, I could always die again, preferably at some much later date. I was more concerned with how Nancy must have felt. What had happened had been

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beyond my control, but I felt guilty about what I must have put her through.

After a while we went for a walk. It was a sunny day, and unseasonably warm, as though the world was having one last fling before the Nomads brought their early winter. Nancy and I strolled through a carefully gardened park that covered acres of undulating land. We talked about nothing that mattered, as if to assure ourselves that there would be time, later, for the important thngs.

Maybe some of what we talked about mattered, in a way. Nancy was unhappy about the headphones I'd given her, which were now lost to the squatters in our apartment. It wasn't like her to get sentimental over a mere object, but her nerves were stretched tight and I couldn't get her to relax.

We had just wandered back to the main building when a bus drifted out of the sky. It was painted in the blue and white colors of the UN, and a moment after it parked in front of the building a half-dozen people in capes skulked out of it—

—a half-dozen kya walked out of it, crouching and gronking quietly among themselves. I recognized Vse and Mrih. Mrih was doing his best to look disdainful of his surroundings, but Vse spotted us and headed our way while the hotel staff began unloading the bus.

She sniffed happily. "Welcome back, John. You were missed."

"Thanks," I said. "It's good to see you again, too."

One of the staff, a vapid young girl with an exquisite body, walked up to Vse. "Hey, I know you, I saw you on the Townsend show last night."

"That was me," Vse said.

"You were on with Ted Ander. He's real cute, isn't he?" She wandered off and picked up a suitcase.

"You were on the cube?" I asked as we went inside. "I thought the media was ignoring you."

"I was wrong," she said. "Being noble-hearted, I can admit a mistake."

"What happened?"

"The night you were shot, one of your politicians said some stupid things about us," Vse said. "Being annoyed, I called the reporter who interviewed him to protest the insults. He offered to interview me that night. I accepted."

"The reporter was hoping for an incident," Nancy explained. "A few indiscreet words to inflame people."

A bellhop came up to us and offered to take Vse to her room. Vse accepted, and spoke in kya as we went upstairs. "Thinking things over, I had an idea. John, you once suggested that, with people knowing they were watched by non-humans, they might be more mindful of their behavior. So I told the reporter that we kya watched how you humans bore up under a crisis, that we admired your courage and hoped we would do as well—"

"And in general," Nancy said, "you lied like a politician."

"I exaggerated," Vse conceded. "But I felt it proper. People are more likely to hear praise than blame, true? And if the theory is correct, it could help your planet through this mess."

"Don't expect too much," Nancy said. "It's a good idea, Vse, but if it's going to work it requires wide-scale contacts between humans and kya."

"I do what I can," Vse replied with quiet dignity. Then, thoughtfully, "The

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cube being what it is, many people must have heard me, and I have made other appearances. Perhaps that would increase the impact?"

"It might," I said. There was no point in telling her that this wasn't the most original idea in the world—on Kya, which didn't have mass communications like we did, it *was* original. "Thanks for trying."

"Here's your room," the bellhop said. She handed Vse a pair of keys. "Will there be anything else?"

"There *is* one thing," Vse said, after she had dismissed the bellhop. "Robots being so common, why do they have human help?"

"Groupies," Nancy said. The word came out fouler than any curse.

"I don't know that word." That's the most common phrase in any human-kya conversation. I explained, and Vse nodded. "Weird. They'll do menial work to be near their heroes?"

"They'll do worse than that," Nancy said darkly.

"Such as?" Vse asked. When Nancy shook her head, Vse sighed and gave up. "I should talk with Mrih now," she said. "I'm supposed to help the embassy staff get set up here."

Mrih? "Where's Zhuik?" I asked.

"On his way home," Vse said, and let out a short snuffle. "There's a big mathematical symposium he wanted to attend. Well, there are plenty more fellows on the plains of life. I'll scent you later." She left.

I put an arm around Nancy's shoulders and steered her into our suite. "Something's bothering you," I said as the door closed behind us.

"It's everything," she said. "Right now it's Vse. She has the right idea, but what she's done is like peeing on a forest fire. She can't have any effect on things."

"Can't she?" I asked. "You said the kya were getting fewer death threats lately. And the staff doesn't act like they're—"

"The staff." She muttered something profane. "What do those assholes know?"

"They know the kya aren't the same as the Nomads," I said. "They take them for granted. That's something."

"They're too stupid to know what's going on!"

"Maybe." I felt taken aback by her flare of anger. "But I know lots of people like them. They're the kind who react on instinct, the kind who go with the crowd—and they're not going against the kya. That's a good sign, and there've been few enough of those lately." We came to our room and went inside. I closed the door and put my hands on her shoulders. "The staff has you upset. What's the matter?"

"It's the way they breathe." Anger writhed across her face. "I'd be a lot happier if they stopped breathing."

"Come on, Nancy. This isn't like you. What's wrong?"

"Does it matter?" Her tone said *back off*.

I couldn't, not when she was so upset. "Yes, it matters."

It was a long moment before she spoke, and when she did her voice was quiet. "When I was a kid Mom always had her damned groupies around," she said. "Gigolos. 'Don't get mad at him, Nance, he might be your daddy.' And in grade school—the other kids always

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found out, I was always the girl who didn't know who her father was. Only I knew," she added bitterly. "He was some stud she forgot after she sobered up. Some brown-noser like the staff—"

I pulled her close to my chest and held her while she spoke in a low, angry mutter. "She didn't get an abortion because having a bastard was good for her career, and she didn't let Dad talk her into marriage until after her career hit the skids. Publicity. Manic Maya sneers at society. She doesn't even *know* what she's put me through . . . but . . . " She laughed weakly. "She's the only mother I've got. She was always there when I was a kid, she always had time for me—"

"And you love her."

"I do. Sometimes I think she doesn't love me." There was that weak laugh again. "That's the first time I ever said any of this to anyone . . . but I know the love's there, she just can't show it to me. Going one-on-one is hard for her."

"You think that's it?" I asked.

Her head nodded against my chest. "Mom cares about things, about what happens to people. It shows in her music. She wouldn't care so much if she couldn't love. Why do you think Dad still loves her?"

I was silent for a long while. Psychologists talk about projection: seeing your strongest qualities reflected in other people. Nancy was doing that with Maya, looking for something that wasn't in her. Say that, and I'd only hurt Nancy. Maya was obviously the most important person in Nancy's life—more important than George, more important than the oddball she'd recently married—and Maya was tearing her apart.

"Poor John," she said eventually. "I'm nothing but trouble."

"You know better." I stroked her scalp. "A year ago I was like a sleepwalker, doing my work and drifting. I was isolated from life. Where would I be without you? Nancy, the only trouble I see is that something's hurting you, and I don't know how to help."

She didn't answer, but from the way her arms tightened around me I knew I'd said the right thing. I'll be damned; a year ago I'd never have managed even that much.

15

We signed the kya treaty the day the Sun went out. Wilkes had come out from New York, traveling in an unmarked and discreetly armed limousine. "Things are as well as can be expected," she told Nancy, and vanished into Mrih's suite.

"That could mean anything," I said, as Nancy and I lounged on a grassy knoll in front of the hotel. We were a hundred yards from where the limo floated. Its human "chauffeur" was busily inspecting its stun cannon in the early morning light. "What do you think is happening in New York? Riots? Banditry?"

"Probably, but Wilkes was talking about the UN." Nancy rested her head on my lap and looked up at a skyful of fleecy clouds. "She doesn't have the authority to sign a treaty—unless things work out. Then she'll be everyone's fair-haired girl, the genius who was right all along."

"So she's gambling her career." If the Security Council decided it didn't

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want a treaty after all, they'd say Wilkes had acted without authority, impeach her and revoke the treaty. I felt surprised—and miffed—and amused.

"And what are you chuckling at?" Nancy asked.

I squelched my laughter. "Well—Wilkes is doing the right thing, and I'm not happy about it."

"So you laugh when you're not happy? You're weird, John."

I chuckled again. "The thing is that for months I've been telling myself she's too self-serving to do anything sensible. Now she's proved me wrong. It's wonderful, she's doing exactly what we want her to do, and I feel betrayed."

Nancy smiled. "The gall of her, showing you up like that."

"What makes it *funny*," I said, "is that I'm a scientist. I'm supposed to take it in stride when the facts don't support my ideas. I suppose I'd have felt better if she'd stuck to my preconceptions and let the crisis get worse."

"So you're laughing at yourself."

"I'm going along with the majority."

"Don't feel too bad," Nancy said. "Wilkes knows she's betting on a sure thing. Anyway—" Her phone rang and she pulled it out. "Nancy O'Donough, this had better be good."

"I think it is," Dowling's voice answered. "The power collector is finished."

"Do the Nomads have control of it?" Nancy asked.

"Yeah. Our monitors have picked up a modulated neutrino flux reaching Mercury. And—wait one." I heard muffled voices in the background. Then Dowling was back on the phone. "We're getting some odd magnetometer readings from Mercury. Either they're turning it on or they're testing it. I'll try to call you if something new happens."

I squinted at the Sun as he hung up. It was as bright as ever, and I looked away with watering eyes.

Nancy put her phone away. "Now we find out if I'm right," she said quietly. "Any thoughts, Mr. O'Donough? Is the human race going to survive?"

This was one of those times when she needed cheering up. "I think so."

"Have you got a reason, or are you whistling in the dark?"

I ruffled her hair crest. "We're not dead yet, and we've got you on our side. That's good enough for me."

The light dimmed and I damned near had heart failure. Was the Sun going out already? Then I realized I was under a shadow; a bus was dropping out of the sky. It twisted sideways as it landed on the lawn. There was a picture painted on its side: the flatheaded Frankenstein's Creature. Beneath it was a sign that read *Frankenstein Centennial Commission*. I recalled hearing somewhere that the first Frankenstein movie was about a century old.

Nancy swore under her breath. "I should have guessed. Mom must have wrapped up her gig. She'd have to come here to dub and cut."

"Whatever that means." I stood and helped her to her feet. "Maybe she decided to hibernate here."

"Yeah." Nancy looked edgy; Maya was the last thing she needed now. "John? Mom's a lot like Mount Vesuvius. Usually she's no problem."

"I'll try to remember that."

We stood back and watched the Tune Saloon receive its latest shipment of

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royalty. I kept my eyes open for Maya, but by the time I spotted her she was bearing down on us like a rabid elephant. "Nancy!" she bellowed. "Why the hell haven't you called me?"

"I did. You never answered your phone."

"Bullshit." She pulled up to us, looked me over and turned to Nancy. "The next time you try to get rid of him, use a divorce lawyer. It's tidier and you get alimony."

I was holding Nancy's hand, and I felt her nails dig into my palm. "Is George coming?" I asked, before Nancy could say something.

"Him?" Maya snorted in disgust. "The bastard's working for the Crisis Relief Assholes in New York. He's never around when I need him. Watch that box, dorkmeister!" Maya hustled back to the bus.

"Let's take a walk," I told Nancy.

"Let's not," she said. "Mom's going to want me to listen to her rough cuts in a while."

"You've had enough rough cuts for one day. Come on." I tugged on her hand. After a second she came with me.

I brooded about murder as we walked away from the buildings. While I'm not the most sensitive man who ever lived, I had figured out that I shouldn't say "bastard" around Nancy, that she was deeply attached to George, and that jokes about my recent death would only hurt her. Maya must have realized that when she had tried to savage Nancy's spirit.

Nancy wanted to believe that Maya loved her. Her stubbornness, usually a strength, was a weakness here; Nancy couldn't admit defeat. She was going to try to reach Maya, and she would keep coming back to her until the old bat destroyed her.

We were a half mile from the resort complex before Nancy spoke. "It's not what you think," she said. "Mom's always short-tempered when she's working on an album. Or when she's on tour. She pushes herself hard—"

I spoke without thinking. Habit. "She hates your guts."

Nancy stopped as if poleaxed. It was obviously true, but she hadn't let herself see it until now.

"She's Manic Maya," I said. "The genius of protest punk. Millions cheered her at concerts and bought her records and listened to her songs. They heard her come out against racism and war and fascism and neo-Stalinism, and then . . ." I gave a shrug. "And then the music stopped, and she looked around, and the old evils were still there. She didn't change a thing."

"She tried," Nancy said, her voice and eyes defensive.

"She tried," I agreed. "And you've tried, too, just like she always wanted. You've followed in her footsteps, and the hell of it is, you've succeeded where she failed. You've made the world a better place, and she's so damned jealous of your success—"

"I get the picture." Her voice was sharp, edgy. She looked angry; I was lucky that green-eyed glare didn't laser two holes in me.

It was time to back off. There would be time to pursue this later—I was feeling optimistic—so I put my arm around her and waited a while before I opened my mouth again. "I've got an idea

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about the Nomads, another reason why they won't kill us off."

She seemed to welcome the change of subject. "Let's hear it."

"Simple. How do they keep their society stable? By coming into contact with alien races. That makes our existence an asset."

"Maybe—but they can keep things stable without outside contacts."

That surprised me. "They can?"

"The math says so." Nancy looked up at me. "You were in the hospital when we figured it out. The Nomads don't live in a single swarm; they travel in a swarm of swarms. Zhuik calculated there are ten million separate swarms, with an average of a thousand members each. Every so often two microswarms bump into one another and interact."

"I see." The actions of the main swarm would be governed by statistics: the size of microswarms, their rate of travel, the frequency with which they encountered other swarms. Different speeds and different populations, fluctuating around certain averages, Brownian motion and the drunkard's walk performed on a galactic scale. It gave the Nomads a dynamic stability, like a gyroscope; so long as they kept moving their society would endure.

"It explains the trouble they're having, too," Nancy said. "Suppose a swarm goes too long without meeting another group—"

"Isolation," I blurted. Then: "That's most likely to happen at the edge of the swarm, isn't it?"

Nancy looked pleased with me. "Smart boy. A microswarm could drift too far from everyone else and get isolated. Contrariwise, a swarm could get too large, or it could come into contact with too many other groups. Crowding is just as dangerous as isolation."

"Wait up," I said. "How can the Nomads get crowded?" I waved an arm at the sky. "Space is big."

"That doesn't matter," Nancy said. "I'm talking about *social* crowding. The amount of space per person is a factor, but the number of people in a society is more important. As the numbers go up life gets more complex, friction increases, privacy becomes scarcer, and more and more people seem like strangers because there isn't enough time to get to know them. That doesn't change when the people are Nomads and can spread out in space, any more than cars and flight cut down crowding in America."

"I think I see." Too much contact, not enough contact—the extreme ends of a bell-shaped curve. One extreme was as dangerous as the other, like having too much water or not enough, too much heat or too little.

"This is what happened to the outlaws," Nancy said. "Their microswarm drifted beyond the edge of the main swarm and got separated too long. Then it grew too large, and its members didn't split up. Crowding and isolation, in different forms—the crowding made them vicious, like big-city vigilantes. Isolation from other Nomad groups made it impossible for them to notice they were changing."

"So they caught the worst of both factors."

She nodded. "If they'd been deep in the swarm, they couldn't have stayed isolated. If they'd been a smaller group,

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there wouldn't have been as much pressure."

"It sounds like what happened at the Kya base," I said. "Isolation and stress, although crowding wasn't a problem."

"That's how I see it," Nancy said. "Of course, Kittrick's *Reich* wasn't dangerous."

"No? Suppose they'd managed to hijack a supply ship and jury-rig some weapons? Kittrick would have raided a colony world for supplies, or waylaid other ships. We were lucky you messed things up before the base got organized. . . . " My voice trailed off as I thought of something. *"That's* why they're here."

Nancy had a rare baffled look on her face. "The outlaws?"

"No, the mainstream Nomads. Remember on the Pluto flight, you said they were coming back too soon?" I watched her nod. "The outlaws are in turmoil, like the base was. Imagine how dangerous they'll be if they get organized. It's the difference between a mob and the Mongol Horde. The rest of the Nomads have to stop them before they turn into more than a rabble. *That's* why they're here. They're improvising a solution, and we have the bad luck to be convenient."

" 'Improvising.' " She didn't sound pleased. "Too many things can go wrong when you improvise."

I scratched her bare scalp. "Yes, I've seen you in action—"

She poked me in the chest. I ducked that, pulled her to me and tickled her ribs—

Her phone rang. Nancy answered it before I could wrestle it away from her and do something fatal to it. "Nancy—"

"Get your ass back here," Maya rasped. "I got some new music and I want your opinion. Bring the walking dead with you, too." She clicked off.

Nancy handed the phone to me. *"Now* you can kill it."

"We don't have to go," I said.

"I'm going," she said, and got up. I doubt she could have stopped herself, any more than a moth can turn away from a candle flame. I sighed and went with her.

The top floor of the Tune Saloon contained a small auditorium. It was packed by the time Nancy and I entered it. The light was dim, but I spotted Maya sitting front-center at the holo display, with Vse at her side. Vse listened attentively, her nostrils flared wide, while Maya spoke to her. I tried to pull Nancy into a seat by the exit, but Maya caught sight of us and bellowed for us to join her.

"I was just telling snotface, here, about what I did to that bastardly innkeeper," Maya said. She was drunk; I whiffed raw alcohol on her breath. She snapped her fingers and a pair of seats rose from the floor, quivering like jelly as they took shape. "You shoulda seen it."

"What happened?" I asked.

Maya grinned. "I kinda hinted that I wanted to hire some local talent for background and crowd scenes. Ye oldee goodman thought I wanted *him* to do the hiring." She put a hand over the place where other people keep their hearts. "Not that I ever *said* anything. The old fart musta misunderstood me. Anyway, he set hisself up as a no-talent scout and interviewed everyone in town. Naturally he charged them for his services."

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"And then," Nancy murmured, "you let everyone know you weren't going to hire anyone, and they decided the guy was a crook. I suppose they took their money out of his hide?"

"Some o' them did," Maya said, scratching herself. She raised an eyebrow at her daughter's disapproval. "The greedy little bigot set himself up, you know. He got what he deserved."

"And he's still a greedy little bigot," Nancy said. "Nothing's changed."

"At least we're even with him," Maya said. Her eyes fixed on me. "Ever screened rushes before, Dracula?"

"Huh?" I asked.

"Didn't think so." She snickered. "We're making a horror vid here. Solid Citizen, our hero, is a viggie, only he's *bored* with it. Guns are too tame for him, he wants to kill with his bare hands. So he visits a mad scientist—" she jerked a thumb at her chest "—an' I transmogrify him into a killing machine. An' when people see what he is, he b'comes a national *hero*.

" 'course it isn't finished," Maya went on. "What you'll see here are the musical sequences. We'll dub an' mix later, squeeze the max impact outta them. Best way to do that is t' get a square to watch an' give his opinions. So make ready with the opinions, Jack." Maya twisted around in her seat. "Roll 'em!"

The lights went out and a city scene appeared on the display. It was night, and the improbable shadows and architecture told me the scene was computer-generated. A solid citizen, a man who looked like the epitome of mainstream America, walked down the middle of the street while muggers skulked in the shadows. They had the look of real humans, not computer constructs. Solid Citizen had a cane, and its tap-tap-*tap* kept time with the rumbling threat of the music. "Kill, kill, *kill*, I need a *thrill*," a man's voice whispered over and over.

The cane was a laser—impossibly powerful, spearing muggers like an entomologist's pins fixing butterflies to a display board. Then the beam flicked the air, chopping street hoods into bloody chunks. The crowd in the chamber howled its approval.

"Good dancers," Maya said as it ended. "Notice how they move? Like rats. Had 'em study caged rats."

"It shows," I muttered. I ground my teeth as a new scene started in the display: a mad scientist's lab, which Maya entered in a blare of noise. Her raspy voice made a rough duet with the computer-enhanced recording. "Welcome to my Holy Land, I hold all life within my hand! You want blood and you want gore, I know it's what you're looking for! I've been working for so many years, distilling all your hates and fears, while your own life's bloody way brought you here this very day!" Things degenerated from there.

Maya's simulacrum pulled a switch and the lab exploded in sparks and flame. Amid the pyrotechnics a monster lurched to life, crashing blindly through a stone wall, and as the dust and smoke cleared I saw it had Solid Citizen's face.

The point-of-view pulled back to show a crowd outside the lab. They stormed into the lab, people of all races, all ages, both sexes, rich and poor, and were transmuted into monsters amid geysers of flame. By the time Maya had

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ranted through the fourth verse they were killing one another for a chance to walk through the Frankenstein machine.

"It still ain't quality art," Maya groused, as an expanding wideshot returned to the crowd outside the lab. . . . a faceless horde that encompassed all of humanity. "It needs something."

"It needs a wipe," I said, standing up. I looked at Nancy. "We're leaving."

She nodded, stood, and followed me out. We walked downstairs and outside in grim silence. Nancy said nothing, but her grip on my arm was painfully tight. I couldn't do much to comfort her, aside from holding onto her; I started to say *It's all right* but the words stuck in my throat.

After a few moments she took a breath. "I'm all right."

"That was awful," I said, as we sat down under a spreading oak tree. I felt polluted just to have watched that display, while Nancy—well, even I couldn't miss Maya's disgust with humanity. I was astonished that Nancy could keep her equilibrium after watching Maya expose her nature.

"She wasn't always like that," Nancy said, more to herself than me. "But idealism sours with age, doesn't it? Especially when you wanted to change the world and nothing happened, no one took her seriously. . . . only *I* did, damn it! *I* was listening!"

I didn't know what to say, so I kept my mouth shut as I put an arm around her. Maybe that was the best thing I could have done. At least it didn't make things worse, but it's a frustrating thing when you can't help the woman you love.

After a while I looked up and saw Vse. She hesitated, then came over to us when Nancy made an inviting gesture. "What did you make of it?" Nancy asked as Vse sat under the tree with us.

"It was distressing, but—compelling. Knowing little of human music, I can't judge that, but the visuals had power. Dark power," Vse added. "I'm sorry I gave her the idea."

"It was a good idea," Nancy said. "What she did with it isn't your fault. What's wrong with it is that it says the entire human race is evil."

"You're not," Vse said. Her gaze seemed to turn inward. "*That's* why it bothers me. Our races being so similar, it says we're rotten, too." She snuffled a bit. "So the joke grazes on me."

"What joke?" I asked.

Vse hesitated. "I—used to read stories about rockets and robots—and aliens. Being fascinated by such, I always wanted to meet aliens."

"And then we turned up," I said. I recalled her frequent visits to our base. The kya had thought we were monsters—with good reason, granted—but that hadn't kept Vse away. "You were looking for strangeness."

"I was," Vse said, "only you turned out to be so much like us that you were, um . . ."

"Boring?" Nancy offered. "Dull? Harmless? Insipid?"

"I would choose less offensive words," Vse said.

I saw it, and I had to fight down laughter. "And then you met Maya," I said.

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Vse nodded. "She *is* what I expected in an alien. Strange behavior, a strange way of seeing things, no regard for conventions—"

"I understand." My arm tightened around my wife. I'd found those qualities in Nancy, too, and more.

"My mom, the terror from space," Nancy mused. "Don't tell her, OK? It'll make her insufferable."

"I understand," Vse said. "However, I *have* been thinking of introducing her to Mrih, to see what happens. . . ."

Her voice trailed off as the Sun went out.

16

I stepped out from under the oak tree and looked up. The sky was sliding from blue through indigo to black. The Sun became a pale disk in the southeast, its face speckled with sunspots. The stars came out and the ghostly Sun faded to blackness.

I'd seen the eclipse of 2017, and it had been something like this. Here was the sudden darkness, the growing chill in the air as the breeze stirred the leaves. There was no solar corona, however, and the place where the Sun had been was surrounded by a void that covered a space as wide as Mercury's orbit. The Nomad's power-field absorbed the starlight I should have seen there.

"They did it," Nancy said in awe. She shivered, and I wrapped my cloak around her. She was a barely-visible shape, lit by stars and the distant hotel lights. "It's so *quiet*."

"It's dark." There had been the sounds of birds and insects, but that had faded. "This happens during eclipses. All the animals think it's night. They're going to sleep."

"Interesting," Vse said. There are no eclipses on Kya, due to a deplorable lack of a moon. "But there is a light," she went on, pointing to a glow amid the black patch. "Is that Mercury?"

"It can't be," I said. Mercury was invisible, along with the other planets and the Moon; there was no light for them to reflect. That violet glow might have been the drive of a starship, but the Nomads didn't use ships—just backpack stardrives and their bare, vacuum-proof hides.

Threads of light appeared in the glow. "Lasers," Nancy said. "From the power transmitter."

"But what makes them visible?" Vse asked. "Space being a vacuum, they should be invisible."

"Dirt," I said. I thought of the Sun's energy pouring through a small point. That torrent of energy must have been shoving the laser discs into the ground. When dirt slumped into the new holes, the beams blasted it away. "It's vaporized dirt, ionized by the lasers."

I don't know how long we watched. The temperature dropped slowly, and the sky began to fill with clouds. When a cloud drifted over the light we returned to the hotel.

A party was in full debauch inside the hotel lobby, with guests and groupies celebrating the darkness. Vse looked as if she couldn't decide whether to snuffle or exhale; even by human standards, an end of the world party is weird. "To paraphrase Orwell, the purpose of party is party," Nancy told her over the din.

Wilkes intercepted us halfway across the lobby. "The treaty is signed," she

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told Nancy. "Now, are we going to live long enough to fulfill its terms?"

"I don't see why not," Nancy said. She smiled a bit. "The Nomads said they wanted to do business with us after this crap is over. That implies we'll survive."

Wilkes looked unimpressed. "Does it? Have you seen the forecasts? We can take six hours of darkness. After that we'll have frost damage to crops in some areas. We'll start seeing deaths from hypothermia after eighteen hours—"

"Hear, hear!" Maya shouted. She was sprawled on a couch, having a W.C. Fields martini: a bottle of gin in one hand and a bottle of vermouth in the other. "Ice City! What's wrong with that?"

Wilkes ignored her. "In forty-eight hours we'll have near-total crop losses," she said to Nancy. "But one full day of darkness will destroy so many crops that even with strict rationing we'll have famines everywhere."

"Good!" Maya said. She dropped her bottles and lurched to her feet, an accomplishment which drew ragged applause from the crowd. "There're eleven billion people on Earth. That's too many. Ask m' darling daughter, the sociologist."

"Shut up, Mom," Nancy said.

"Too many." Maya staggered up to Wilkes. "Gotta get rid of most of 'em. Looks like the Nomads are doin' what we don't have the balls t' do."

"Triage," Wilkes said coldly. "Kill the excess people, right? You first."

Maya snickered. "You're so fuckin' moral. If the Nomads won't do it, we'll have to do it ourselves. Vigilantes an' mass suicides and psycho-bigots. Crowded rats. We need war, plague, famine. Megadeath's th' only way out, only way to save *some* of the world." The crowd gave her more drunken cheers. I heard Vse exhale, although nothing could clear this stench from any nostrils.

"No," Nancy said. "There has to be another way."

Maya leveled a finger at her. "Grow up, kid. Y' can't keep the world from blowing apart, can't keep workin' miracles with science and politics. So what else can you *do?*"

"Keep trying," Nancy said.

"Trying?" Maya demanded. "What in hell *for?* Watch this." She turned to the mob around her. "Listen up!" she shouted. "Should we cut the numbers now? Build us some death camps, fight some wars, tear loose with the Four Horsemen?"

The lobby howled with approval. "Go for it!" voices shouted. "Kill, kill, *kill,* I need a *thrill!*"

Maya looked back to Nancy. "Hear that, daughter mine? That's what you're working for. Th' noble Common Man. Solid Citizen. They think mass murder is a fucking *joke.*"

I looked at the freak show surrounding us. "Not everyone is like this," I said.

Maya eyed me as if I'd crawled up from the sewers. "Oh, no, everyone else is *refined.* Tidy. They have microbots t' adjust their beds and their baths and flush their toilets. Robot cars t' drive 'em home when they're drunk. Waste an' luxury—long as they have their comforts, they don't care *what* happens to anyone else. See war an'

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famine in their cubes, and they just *watch*. You think a species like *that* is worth saving?"

"Have you got a better idea?" Nancy demanded, while Wilkes stomped out in disgust. "Even if the whole human race is rotten, so what? It can get better. Even these leeches you call friends could change—" she raised her voice over their jeers "—and that makes them worth something, whether they like it or not! That's what you used to tell me, isn't it?"

They laughed at her. Someone spritzed her with beer. Somebody else threw a pillow. I took her by the arm and hauled her out of the lobby before there was real trouble—from them, from her, from me. "That was a waste of breath," she said.

"You were magnificent," I said, as I led her downstairs. "They just don't want your help."

"So? I didn't ask them."

"What do you think you can do for *them?*" I asked. I got out a handkerchief and blotted beer from her face. "Turn them into humanitarians? Get them to lead constructive lives?"

"No. You know what I want?" Nancy laughed unsteadily. "I want them to go on being scum, if it's what they want. But they . . . everyone . . . should have the chance for something better. That's what civilization is all about. That's what I want."

"It's what Maya used to want."

Nancy hesitated, then nodded. "Deep down she still wants it. I *know*."

I pulled her into a stairwell, for privacy—I didn't want to have my arms broken in public. "Not any more. Maya is burned out."

"She is *not*," Nancy insisted.

"Then why does she hang out with those roadie-rats?" I asked. She looked away. "It's because they don't make any demands on her. Nancy, face it. Maya isn't a superhero. She—"

"Shut up," she said coldly. "Maybe Mom *is* burned out. I don't know. But if she is, she earned it. She took more crap in a day than you've taken in a life."

"Her?" I asked in disbelief. What sort of crap could an overpaid rocker take? Publicists wanting one more photo, please? An extra set during a concert? Ten percent less cash for her next album? "Her?"

"Her," Nancy said angrily. "The music world—Mom's songs told people to get their act together. And what happened? People said the message got in the way of the music. They said she was only a sex symbol with a good voice, someone who ought to sing frothy pop songs instead of anything worthwhile—it wears you down when you have to fight every minute to make people take you seriously."

Nancy could have been talking about herself, and—well, I'd never thought about Maya that way. "I'm only trying to help—" I began.

"Forget it. Just forget it, OK? And quit trying to play junior psychiatrist with me. Let me work this out by myself."

"All right," I said. Wonderful, I thought. Nancy knew she had a problem, and she knew what it was. The only thing she didn't know was that it had no solution. I couldn't argue with her; every time I spoke I sounded as if I was trying to drive a wedge between

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her and Maya, and that was the last thing she needed from me.

I was almost grateful that the Nomads gave me something else to worry about. "Come on, let's go to the comm room," I said. "I have an idea I want to check."

We went downstairs. The basement of the Tune Saloon was a tangle of narrow hallways and tiny rooms. Glowing lights in the floor led us to the communications center. "Get me Chris Dowling," I told the phone as I closed the door behind us.

Dowling answered on the tenth beep. His image glowered out of the cube. "This had better be good."

"It is," I said. "How fast is Mercury accelerating; when will it cross Earth's orbit; what happens when we're inside the power field?"

"Be damned," he muttered. He turned to someone out of sight. "Hozier, get on that. John, we've got a ship inside the orbit of Mercury, reporting *via* tachyons. They get through the shell all right. The *Burroughs* reports they can see the Sun. The solar flux is normal in there."

"John, what's this about?" Nancy demanded.

Dowling answered, spoiling my chance to impress her. "The lasers are working on Mercury like a rocket engine," he said. "They're increasing Mercury's orbital velocity, pushing it away from the Sun. Enough thrust over enough time will push Mercury beyond Earth's orbit—"

"—putting us *inside* the field," Nancy finished. "When will we have the Sun back?"

"It depends." I heard rapid clicks as he worked a keyboard. "At one gravity acceleration, about thirty-six hours."

"That's too long," Nancy said. "Earth'll freeze before then."

"Probably," Dowling agreed. He grunted. "Mercury can't accelerate that rapidly anyway. Tidal forces and mechanical strains would shatter it. That would wreck the collector systems, too."

"Oh." Damn. It had seemed like such a good idea a moment ago. "What are those lasers aimed at?"

"Nothing we can detect," Dowling said. "They're just blasting off in all directions. They're aimed at fixed points in space, but there's nothing *at* those points."

There was a muffled voice. "Boss, radial acceleration is oh-point-oh-four gravities."

"Nuts," Dowling said. "At that rate it'll cross Earth's orbit in ten days. That's too late to help. Nancy, have you heard anything?"

"Not yet."

"Keep me posted, that's a good kid." Dowling clicked off.

"A light show," Nancy said. "Is that all they're doing with the lasers?"

"Maybe. I can't figure it." I could picture the lasers relaying the Sun's power to alien battle stations, but these beams weren't tracking anything. They seemed to be aimed to cancel one another out, or almost so—it looked like even the Nomads could miscalculate, which was not the most reassuring thought I'd ever had. "They aren't doing *anything* with all that energy," I complained. "It's all going to waste."

"Yeah." She looked thoughtful. "I wonder what they're seeing on Pluto?"

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"Nothing, yet." I checked the time. "Pluto is six light-hours from the Sun. They won't see the Sun go out for another five hours."

"Oh . . ." But she still looked thoughtful. "I wonder if those two Nomads are still there? Call Non-Human Affairs," she told the phone.

The woman who answered was reluctant to talk, but she was no expert at keeping secrets. Nancy hurled questions at her, rattled her, and hung up. "The Nomads are gone," Nancy said. "Right when the Sun went out, too. I wonder where they went?"

"Search me," I muttered. "I'd rather hear directly from Pluto. This place doesn't have a tachyon radio, does it?"

"Why should it?" Nancy asked. Reasonable question. "But we can relay a call through Orbidyne."

"Let's do that," I said. "I've got a few other questions."

Nancy set up the call. "Tombaugh Base," a nasal Australian voice said as the call went through.

"John O'Donough," I said. "I'm with the UN. I need to know if you've picked up any new neutrino sources."

"Hold on." There was a moment of silence. "We've got one large source, range ten light-hours or so. That's bloody close. Look, mate, I'd like to chat but things are bloody tight here. Tombaugh out." He clicked off.

"The outlaws," Nancy said. "They're on their way."

"But to where?" That Aussie had cut me off before I could ask a few more things.

"At least we know where the outlaws were ten hours ago," Nancy said. "And that Tombaugh can track them. I wonder what sort of attack they plan? If they reach Earth—"

"Forget it," I said. This was no time to worry about things we couldn't change. "We're counting on the good guys cutting them off at the pass. Anyway, I'd rather talk what *you* have planned."

She fluttered her eyelashes. *"Moi?"*

"Yeah, you, Miss Green-eyed Innocence. What have you got in mind at the UN?"

"You haven't guessed yet?" I could see how that pleased her.

"You're still three squares ahead of me."

"Poor John. Let's have some coffee." A wall panel opened up, exposing a pot and some mugs. Nancy poured for us. "If there's one thing I know, it's how to work with aliens. The UN needs a reliable source of information about aliens, something that can assess their motives and intentions and tell the UN when it's screwing up. You don't think it's a good idea?"

"I dunno," I admitted. I could see the need for that; we were bound to meet more and more alien races, and many of them would be stranger than the kya—and more dangerous than the Nomads. Ignorance could get humanity killed. And yet—"You want to set yourself up as an advisor?"

Nancy nodded. "I've got zero seniority, but plenty of experience—and a few connections. If I can't get people to listen to me directly, at least people like Dad and Mr. D. can pull strings and plant ideas for me."

I sipped my coffee. The aroma was wonderful, but like everything else at the Tune Saloon it left a bitter taste. I put it down. "What makes you think

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anyone at the UN will take your advice, directly or not?"

"They've *been* taking it," Nancy said. "At least, they've been hearing it. And in the past few weeks I've talked with just about everyone I ever met at the UN."

"Ah *hah*." Light dawned. *This* explained a lot of things, from her leave of absence to the visitors at our multi.

"An advisor needs a good reputation," she said, confirming my guess. "Part of that comes from being right, but it also means that people have to *know* you're right. My leave of absence left me free to do that. It also dissociated me from the Security Council's idiotic 'Bolds' and 'Timids' notions."

"So you kicked up the biggest fuss you could."

"Think of it as a public-relations gimmick." Nancy finished her coffee and put the cup aside. "It's hard to ignore someone who's right, especially if you're a politician. A good advisor is like a security blanket."

"And they can be blamed for bad decisions," I said.

"There's that." The idea didn't disturb her; I suppose she'd already taken it into account.

We talked for quite a while about her plans, although I couldn't work up much enthusiasm over them. Realistically, I knew Nancy couldn't hope for more than what she had planned. I also knew it wouldn't work. She was too much of a maverick, and nobody listens to those until it's too late. She would do her best for the human race, but her best might not be enough when the next crisis rolled over us. Something more was needed.

The phone rang late that afternoon. "We have a message from Pluto," Dowling's voice said. "They can't see the Sun now, and a mass of Nomads just came out of t-space."

"Have they done anything?" I asked.

"Not yet. They're on the move. We're analyzing the tracking data now. Here's the downlink."

There was a crackle of static and we heard the Australian again. "—Two thousand and fifty-two of the blighters. The main body is not, repeat not, using jamming or other countermeasures. There is a smaller group, numbering approximately ten, which is using minimal countermeasures. The main body appears to be chasing them. They're going like bats."

I looked at Nancy. "Does Tombaugh Base know about their weapons?" I asked. She nodded curtly.

"Are they close to Pluto?" a new voice asked.

"You flaming idiot," the Aussie said. "They have to be close for us to spot them."

"Range fourteen thousand kilometers," a calmer voice said. "Control, there's a bright light out—" There was an electronic screech and the voice chopped off.

"We've lost the downlink," a voice said. "All stations, is anyone getting a signal?" There was no answer.

"They destroyed the base," Nancy said. I was too stunned to speak.

"I'm afraid you're right," Dowling's voice said. Then: "We've got their trajectory now. They're heading for Earth. They'll be here in a half hour."

"I understand," Nancy said. She

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looked at me and I nodded. "Good luck, Mr. D." She hung up.

We had to go outside. There was something intolerable about staying—and maybe dying—in the basement. Nancy and I found jackets, bundled up and went outside.

The Sun would have been low in the western sky. Instead there was a black patch on the horizon. Mercury and its lasers had already slipped below the horizon. The rain had ended hours ago; the sky was clear, and the breeze was chill and dry. I saw a few lights on the horizon: not everyone had evacuated to the coasts.

"There's going to be a fight," Nancy said; looking at the stars. "John, the outlaws are going to lose. I just wish I knew *how*."

"Same here," I said, although I didn't believe her. Over two thousand outlaw Nomads versus ten of the civilized kind—that made the odds two hundred to one. The good guys had blown it.

But in that case, why were they running for Earth?

Maybe they didn't believe in changing tactics in mid-battle, even while losing. There have been human cultures which thought that way—death before dishonor and all that. It might have been noble as all hell, but it was going to get humanity exterminated.

No, it wouldn't, I realized. We had colonies on a few worlds. The outlaws might destroy Earth, but the race would go on. I felt a rising pride; we humans are too tough to kill off.

Something sparkled in the sky. "There they are," I said, and held on to Nancy. The sky had come alive with nuclear fire as the outlaws attacked the satellite web. When the monsters ran out of space targets they would move against Earth itself—

And light exploded in the sky as the Sun returned.

17

"I still don't understand," Wilkes said the next morning. We were on one of the Tune Saloon's patios, lounging in the Sun. Wilkes, UN-uppercrust that she was, had done nothing more than unbutton her coat, while Nancy and I had peeled down to a level that was conservative only by Tune Saloon standards. "The Bolds—the *outlaws* are all dead, but how did the Nomads *do* it?"

"The tactics were simple," I said. I'd explained it all last night, but to tell the truth, we'd all got pie-eyed during the survival celebration. "First, they surrounded the Sun with that energy-absorbing field. That made the Solar System look like an industrialized neighborhood, one that used the energy output of a star. A very inviting target for vandals or barbarians, right?

"That set the stage. The Nomads led the outlaws to Pluto and let them destroy it—I guess the purpose was to show the outlaws we were a soft target, which would make them even less cautious. Then they led the outlaws to Earth, making million-mile jumps through t-space. Each jump brought 'em closer, and showed the outlaws that the Sun was still shielded."

"Charming," Wilkes muttered. "But they could have jumped straight from deep space to Earth orbit."

"And made the outlaws suspicious."

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I shook my head. "They were demented, but not stupid. The Nomads turned the Sun off for six hours because that's how long it takes sunlight to reach Pluto. That gave them perfect darkness from Pluto to Earth—"

"And a few minutes before they reached Earth," Wilkes said, "they turned off the field."

"Eight and a third minutes," I said. "That's how long it takes light to travel from the Sun to the Earth. The Nomads timed it perfectly. They wore heat shields, but the outlaws didn't—"

"Why not?" Wilkes wondered.

"It's like in the old Westerns," Nancy said helpfully. "The bad guys *never* wear white hats."

"The outlaws didn't think they'd need them," I said as Wilkes groaned. "If a solar system uses all the energy from its star, then a power failure would be a catastrophe. The field *can't* go out. Ordinarily it must have back-ups like crazy. If the outlaws expected any resistance, they must have thought we'd use the Sun's energy to power battle stations or something."

"Then that explains why they attacked our satellites first," Wilkes said. "They thought they were disarming us. So they didn't expect us—well, the Nomads—to use the Sun itself as a weapon."

"Nope." Had they even had time to know what hit them? One moment they were in frozen darkness, blasting satellites and spaceships. Then the field went off and the Sun came back in full force, vaporizing the unshielded outlaws.

And now the Nomads were giving us the power collector—and Mercury. Mercury was now on a transfer orbit, coasting from the push the lasers had given it. In a few months the Nomads would park it in an orbit around Mars. The power collector could run out there without harming Earth; we would be inside the field.

There was more. One of the collector's subsystems was designed to remove Mercury's mantle, and use the lasers to blast the dirt into space. In a few years the mechanisms would reduce Mercury to its core, giving us almost five billion cubic miles of metal. Say goodbye to energy shortages, resource depletion, strip-mining and a hundred kinds of pollution. Say hello to unlimited prosperity, if we had the wits to use this properly. It was quite a payment, but the Nomads had presented quite a risk.

A servitor rolled around the patio, offering coffee and cheese Danish. "Essentially," Wilkes said around a bite of roll, "the Nomads turned the Sun into a giant bug-zapper. But—how could they know it'd work?"

"Basic physics—" I began.

"No, no," she said impatiently. "What if the outlaws had sent a scouting force ahead? What if they'd noticed that we *weren't* using the power from the Sun for anything?"

"Then we'd have been up the creek," I said. "But they were here to loot and destroy, and they didn't need scouts for that. Besides, scouts would have hogged the loot for themselves."

"That's not the real answer." Nancy looked to Wilkes. "The outlaws were just a mob. When their social structure collapsed they fell into a simpler pattern, a lower level of civilization. They

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were too disorganized to do anything as sophisticated as deploy scouts or plan strategy. The other Nomads took advantage of that weakness."

"I see," Wilkes said. "Discipline and training will always beat chaotic fury, because a mob can't think ahead. That's how small police forces defeat rioters."

"So this was a police action," I said. I bent over and rubbed some sun lotion onto Nancy's shoulders. "They weren't fighting a war after all."

"Naw," Nancy drawled. "All they did, Tex—"

"I'm from Oklahoma."

"—was to get up a posse and go after the bad guys. I don't know how they decided to handle this, but it's obvious they took the path of least resistance."

Wilkes nodded. "Simplicity has to be a key ingredient of their stability. Complicated systems are always more likely to break down when you need them. Speaking of stability—"

"We're still waiting to hear from the Nomads," Nancy said. "When they call, I'll ask about your request—"

"Don't," Wilkes said, surprising me. "I've had second thoughts."

I had the feeling they were first thoughts. "What are they?" I asked.

Wilkes shrugged. "World stability looks wonderful, but now I'm not sure it is. What's stability done for the Nomads?"

"They've lasted for fifty megayears," I said.

"And they just gambled with our lives," Wilkes said. "They butchered Correy III because the natives *might* have inconvenienced them. They sacrificed Tombaugh Base to help draw in the outlaws. And for what?"

"For their own survival," Nancy said.

"But why do they survive?" Wilkes asked. "All they *do* is drift around without a purpose. Life has to mean more than that. Besides—"

"Besides, you heard what Maya said," I said. I felt an idea take shape. "Maya's as unpleasant as—as—Maya, but she's right about the human race being in rotten shape."

"Yes." Wilkes laughed sourly. "She *is* right, damn her. If we stabilized now—well, growth is an unstable condition, and we need to grow. We should bargain for what we need, not for what looks good."

"We might want to hire the Nomads as consultants," Nancy said. "Outsiders always have a better perspective than insiders."

Including the illegitimate daughter of a punk musician, I thought suddenly. And it was time for somebody to turn Nancy into an insider. "I suppose this is something Non-Human Affairs could handle," I said.

"Possibly," Wilkes agreed. "I'll take it up with them."

"There's something else to take up," I said. "The UN could use a new Director of Non-Human Affairs. You can nominate Nancy at the next Security Council session."

I think Nancy looked marginally more surprised than Wilkes. "What are you talking about, John?" Nancy asked.

"You heard me," I said. " 'Unofficial advisor,' my butt. I'd feel a whole lot better if I knew you had some real power—"

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"No," Wilkes said. She sounded pained. "It can't be done."

"Pity," I said. "If Nancy isn't in charge of Non-Human Affairs, she won't be able to keep Vse from talking." I paused.

Wilkes made a growling noise. "Talking about *what?*"

"The UN Fleet," I said patiently. "The one you had assembled to assist the outlaws. You remember when everyone was talking about how we had to join the Bolds against the decadent—"

"I had nothing to do with it." Wilkes sounded very convincing, but we both knew she was lying.

"Of course you had nothing to do with it," I said. "But other people did, right? They'd hate to have reporters looking for incriminating records. Think of what would happen if people learned they nearly got the human race wiped out through their stupidity. You could offer to, um, *protect* them if they'll help appoint your fellow American to Non-Human Affairs. That way Vse—who never signed any security oaths—won't talk about this." I made a mental note to discuss things with Vse.

"Goddamnit, John, you're getting me in trouble," Nancy said. "If everyone thinks I blackmailed my way into this—"

"You did not," I said. I hooked a thumb at Wilkes. "This is all *her* idea."

Wilkes looked affronted. "*My* idea?"

"It must be," I said sweetly. "Or would you like to have people think that Nancy and I forced you into it?"

Wilkes ground her teeth. "No."

Of course not; it would ruin her reputation if people knew she'd been outmaneuvered by those damned O'Donoughs. "You can see advantages to having Nancy run Non-Human Affairs," I went on. "She's young and easily influenced, so you can keep her under your thumb. And she does a good job. I'm certain you can convince everyone you've had a stroke of genius."

I had to give Wilkes points for magnificent self-control; she didn't blow a gasket before she spoke again. "I think we need a new director for the Non-Human Affairs Office. Does the job interest you, Mrs. O'Donough?"

"It's something to think about," Nancy said. She got up and stretched like a cat. "John, why don't we go for a walk? I want to break your neck in private."

We walked off the patio and around the building. I felt like turning handsprings on the grass. Look, we'd survived one major crisis, and so what? It was a big Universe, and there were bound to be more problems. But with Nancy in a position to influence humanity's actions—well, the Universe didn't have a chance.

And Wilkes would never try to blackmail *me* again.

Nancy waited until we were out of Wilkes's hearing. "What in *hell* were you doing back there?" she demanded.

"Something you wouldn't have thought of," I said. "Nancy, you're so used to being on the outside that you'd never have tried this."

"Well . . . " I had her there.

"And we both know you and the job go together," I continued. "Running Non-Human Affairs will give you more prestige than you'd have as an unofficial advisor. Wilkes can't control that. And people are more willing to listen to

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someone who works inside the system than they are to mavericks."

"True." She looked calculating. "And it's not a powerful position, so people won't feel threatened by giving it to me—"

"Exactly," I said, and smiled. By God, she *hadn't* figured everything out. For once I was ahead of her. "But it *will* be a powerful position. We're in the galaxy to stay, and that means we'll have to deal with aliens. Lots of aliens. By the time the UN figures out how important that is—"

"They'll replace me."

"After you've turned Non-Human Affairs into a force to be reckoned with. I know how much you enjoy being a diplomatic outlaw, but now you can be more useful to the human race working inside the system. That's worth twisting Wilkes's arm."

Nancy laughed quietly. "What a *mensch*. I never thought you had the makings of a cutthroat politician."

"You're a good influence, kiddo," I said. "Speaking of good influences—do you think Wilkes meant what she said? About political stability and all that?"

"She meant it," Nancy said. "She wouldn't throw away power on a whim. I think—"

"I think Maya opened her eyes," I said. "Which makes that scene at the party the best performance she ever gave. You ought to tell her about this. It won't hurt to let her know she's done some good."

Nancy's eyes lit up in surprise. "I bet it will. If—"

There was a clattering and a roaring, and I saw furniture, bottles, and musical equipment hurled out a window of the Tune Saloon. A couple of Maya's players jumped out after it, followed by a barrage of curses unique in the annals of profanity.

One of the musicians stood and shook his fist at the window. "I'll *sue!* We have a *contract!*"

"Piss on it!" Maya bellowed from the window. She threw a desk drawer at him. "And if you ever spray beer on my daughter again, I'll piss on *you!* Now get your ass out of here before I shoot you for impersonating a musician!" The two men ran away, pursued by flying junk.

Maya spotted us watching her. "What are you staring at?" she snarled.

"We're waiting for the matinee to start," I called back. I nudged Nancy and we went to the window, while Maya climbed out to meet us. "What was that all about?"

"Creative differences," Maya said. "Artistic stuff. I wouldn't expect a tone-deaf putz like you to understand."

"What *is* going on, Mom?" Nancy asked.

"I'm reworking *Young Dr. Frankenstein,*" she said. "After you two left the party last night, snotface told me it sucked, and—aw, hell, she was right. I'm changing Solid Citizen into a typical vigilante instead of an Everyman. And when he gets changed into the Monster, people see the light and turn against him. They destroy him and the mad scientist. I go out in a ball of fire."

"It sounds classic," Nancy said. "Good triumphs over evil."

Maya snorted. "You're turning maudlin. That schmuck you married is corrupting you. I'm rewriting it because it plays better this way." She sneered

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at me. "Why aren't you in your grave, Dracula? The Sun's up."

"I know," I said. "I just dropped by to congratulate you on last night's performance."

"Performance?" Maya looked suspicious.

"The one you gave Wilkes." I turned to Nancy. This was something she had to handle alone. Maya would fight, but she didn't have a chance against Nancy. "You tell her. I'll be in our room."

"Sure. John?" She grabbed my shoulders and gave me a toe-curler of a kiss. "I don't know how long this'll take."

"There's plenty of time," I said.

Plenty of time? I thought, as I left them on the lawn. Sure, we probably had at least five minutes before the next crisis. ■

IN TIMES TO COME

● Our 13-month calendar makes it a little hard to decide what is the "right" issue for "seasonal" material, but since the November issue goes on sale in September and stays out for most of October, it seemed as good a place as any for a "Hallowe'en" story. It's by Michael F. Flynn and it's right at home in *Analog,* so you can rest assured it's *not* "just a ghost story," even though it involves a place (which just happens to be real) with a long-standing reputation for being "haunted." The science fiction comes in when a physicist decides to investigate the peculiar phenomena that have been reported. *Any* real phenomenon is a suitable subject for scientific study, of course, but what people find and how they react to it depends very much on their backgrounds. And that's true for *all* kinds of people, scientists or otherwise. . . .

Even though Flynn's story is very much science fiction, it doesn't lend itself to the kind of cover that proclaims that fact to a newsstand browser. That honor goes to a new Christopher Anvil novelette about some extraterrestrials with a fiendishly clever scheme for overcoming human resistance to conquest. There's just one little thing they overlooked. . . .

We'll also have stories by Maya Kaathryn Bohnhoff, L. E. Modesitt, Jr., F. Alexander Brejcha, and Julia Ecklar, plus a *very* basic fact article by Stephen L. Gillett, Ph.D., about planet formation—but in this case "very basic" does *not* mean trivial!

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the reference library

By Tom Easton

Agviq, Michael Armstrong, Questar, $?, ? pp.
Cortez on Jupiter, Ernest Hogan, TOR, $3.95, 244 pp.
Voyagers III: Star Brothers, Ben Bova, TOR, $18.95, 352 pp.
Rounded with Sleep, Rob Chilson, Questar, $?, ? pp.
Human to Human, Rebecca Ore, TOR, $?, ? pp.
Strings, Dave Duncan, Ballantine/Del Rey, $3.95, 313 pp.
The White Isle, Darrell Schweitzer, Owlswick Press (Box 8243, Philadelphia, PA 19101), $18.95.
Nebula Awards 24, Michael Bishop, ed., Harcourt Brace Jovanovich, $22.95 hb, $13.95 pb, 302 + xviii pp.
Breakout into Space: Mission for a Generation, George Henry Elias, Morrow, $16.95, 224 pp.

Michael Armstrong's **Agviq** gets the place of honor at the head of this column because it is the best book I have read this month.

It is not the best because Armstrong invents a host of new science fictional ideas. It is not the best because he invents new stylistic pyrotechnics. It is the best because, even though the basic theme—survival after nuclear holocaust—is old enough to show signs of wear, Armstrong has managed to renew the shine by finding a new setting and new problems to go along with the main problem. He also handles his characters well. And he writes nice too.

The central character is Claudia, a doctoral candidate in anthropology. She is digging out an old Inupiaq (the "Real People") Eskimo house when the radio delivers the bad news. She and her assistant convert the dig into a fallout shelter (with a nod to Dean Ing), survive, and face the task of finding others. The assistant dies. Claudia reaches Barrow and finds a few modern Inupiaq, bereft of the ancient technology that made sur-

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vival in the far north possible before the whites seduced the locals with sno-goes, VCRs, rifles, and other inducements to forget tradition. Fortunately, an elder, Malgi, recognizes that Claudia may be their one best hope. She alone has studied the ancient ways of life. She, more than any surviving Inupiaq, knows how to survive.

The basic plot is simple enough: Take a people who once managed just fine, thank you, using no more than local resources. Take away their knowledge and replace it with dependence on gadgets and resources from afar. Then take away the source of supply for those gadgets and resources. The result is conflict between people and their environment, between pigs and sharers, murder, hunger, and if all goes well, if the community has anyone at all who remembers the past, even if that person is a dry, theory-burdened academic,[1] a struggle for survival that builds—long before it can possibly succeed or fail—a very strong sense of community, and a community of Real People indeed.

That struggle for survival hinges on *agviq*. *Agviq* is the Inupiaq name for the bowhead whale, the creature whose tons of flesh and bone literally guaranteed the survival of the pre-contact Inupiaq. It plays the same role here, and thereby underlines the connection that Armstrong stresses between past, present, and future.

Need I add that I have given this one a Nebula recommendation?

Ernest Hogan's **Cortez on Jupiter** is the latest Ben Bova Discovery, and it's worth your discovering it too. It's energetic, fast-paced, funny, and thoroughly enjoyable. The title character, Pablo Cortez, is an artist (the Pablo in his name) and a discoverer of new worlds (the Cortez, of course), at first in art but later in . . . The tale is a prolonged media interview, introduced by the revelation that Pablo is famous for his zero-gee splatter-painting and that there is a "Willa, the Zulu goddess that pollutes my Aztec pantheon." The interviewer draws out his history —orphaned young, fixated on Aztecs, sprinkling Spanishisms throughout his English, a wandering graffiti artist who falls in with a group of California art students and leads them to become the Guerrilla Muralists of Los Angeles. The GMLA is in due time nailed by the cops and most of the members join up with the art establishment, but Pablo goes into space, eventually to volunteer for a sure-death alien contact mission.

The aliens are the microscopic Sirens of Jupiter's atmosphere. They seem to be telepathic, and every human who is lowered into their realm dies, brain-wiped. Yet the science lab-media giant collaboration that rules the mission keeps trying—after all, the deaths are great theater and the ratings are tops! And now here comes Pablo, with a crush on another volunteer, the telepathic Willa. Not surprisingly, given the story's beginning, he lives. He also unifies art, energy, love, fascination with the Sirens, and more.

Are there problems? Readers who recall this nation's reaction to the *Challenger* blowup may have some difficulty accepting amorality that permits so many sacrifices to the Sirens. But we should remember that the true god those sacrifices propitiate is Media and that Hogan has woven into his fabric a strongly Aztecan thread. He is playing

[1]Too many people—voters, bureaucrats, funding agencies—forget that those dry-as-dust academics, who spend their lives worrying about minutiae that mean nothing at all to anyone with a grain of sense in his or her head, are the memories of our species. Sometimes they are also the consciences.

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games with us, with the idea of the sacrifice who becomes the god, and with the overweening greed of the media. He thus offers us pleasures beyond what and how he tells us of Pablo Cortez's adventures.

Ben Bova's own stories *Voyagers* and *Voyagers II* gave us Keith Stoner, an astronaut who visits a strange alien spacecraft that came zooming into the solar system, gets marooned, and freezes solid. Fortunately for him, the spacecraft is actually a sarcophagus bearing the dead body of an alien whose system is thoroughly pervaded with symbiotic nanogizmos that maintain health and life for long periods. They can even undo the damage of freezing, and when they invade Stoner's body they do precisely that. Thus, when Jo Camerata, Stoner's true love back on Earth, grimly, determinedly pushes herself to a position of industrial preeminence that can force a mission to retrieve Stoner's body, he—alone among all corpsicles —can be thawed successfully. Once more among the living, he finds his symbiotes carry a complete knowledge of the alien technology, and even of alien history, underlining the hazards of nanotechnology and the need for some sort of social maturity before a species can handle it well. Disturbingly to the people around Stoner, that maturity comes across as flattened affect—he doesn't "feel" things as deeply or vividly as others. To the symbiotes, and eventually to Stoner, maturity translates as control, suspension of emotional fits to let Stoner act from reason, from altruism, from his and the symbiotes' sense of what is best for humanity, not from anger, jealousy, fear, hatred, or even love. Stoner dedicates his life to fostering a similar maturity in the rest of humanity. He begins by giving a few selected "Great Souls" injections of symbiotes. He himself does his best to discourage wars, encourage peaceful solutions, and introduce—slowly—alien technology.

Voyagers III: Star Brothers begins with some recapitulation and expansion of the above. Immediately thereafter it dives into the ominous. Megacorporate schemers wish to get rid of Stoner's and Camerata's unprofitable emphasis on helping the poor and downtrodden. One has a suspicion of Stoner's powers and wishes to seize them for himself; he will stop at nothing—torture, vivisection, kidnapping, murder. A new plague has arisen, one that destroys the digestive system in such a way that victims digest their own internal organs, and the astute reader promptly suspects that the plague may have something to do with nanotechnology, an all-too-human, all-too-insane, perversion of glorious potential.

Greed, intrigue, madness. The hallmarks of human folly. Precisely what Stoner is striving to defeat in order to create Utopia. Perhaps it is not surprising that in the end events defeat Stoner's well-intentioned attempts to save humanity from itself and emphasize that salvation is something humanity must achieve for itself.

You can trust Ben Bova to do a superlative job, and you won't be disappointed. *Voyagers III* has everything —high tech, aliens, threats of disaster, true love, noble courage, conniving wickedness, a slam-bang ending, and a final ride into the sunset. You'll love it.

Rob Chilson's newest book is **Rounded with Sleep,** and it is intriguingly "dedicated to me—to the young boy who eagerly read *Conan*, from the old man who wryly remembers." The future is one in which computers and

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robots have relieved humans of all need to labor. People now sleep in subterranean caverns, exercised and fed by the computers,[2] while their minds inhabit vat-grown bodies whose brains have been replaced by radio transmitters and receivers. The bodies are those of kings and wizards, heroes and whores, peasants and thieves. The world has been given over to the Games, ultimate descendants of today's role-playing games. Africa is home to the Sword-and-Sorcery Game, America to the Wild West Game, Europe to the Game of Fantasy and Elves. Many of the spear-carriers and all the monsters are computer controlled. There are writers and fans and . . . There are a number of echoes of SF and fandom, and a strong suggestion that the whole business, especially as it focuses on mighty thews, big bazooms, intricate intrigue, and bloody slaughter, is pretty puerile.

The hero, Andy Thatcher, has just gotten his Game persona killed. On R&R leave while the computers and writers set him up with a new body and role, he falls in with a fan who takes him on a round of parties that nearly grinds his R&R equipment off. Exhausted and bored, he cries to the computers, "Help! Get me back into the Game!" But once back in play, he finds that he no longer takes the Game as seriously as he must if he is to survive in it. He is skeptical, irreverent, playing his hero as if his script had been written by P.G. Wodehouse. He thus gets mashed again, and again, and again. Eventually, he asks the computers some pointed questions and learns that every so often people do grow out of their fascination with thud and blunder.

What do they grow *into?* Hermits? Parents? How about laughter? What do grown-ups *do?* Especially when computers and robots do all the important things in the world. Chilson has a suggestion or two, but I'll let you find what he says for yourself. I think you'll enjoy the process.

Rebecca Ore's first novel, *Becoming Alien*, earned high praise here and elsewhere for her portrayal of an intelligent human, Tom Gentry, reared as a redneck hillbilly, who moves from Earth to Karst, the center of a multispecies interstellar confederation, and must suppress xenophobia, learn tolerance, and acquire new ways of thinking, becoming indeed a nonhuman alien in several essential ways. Earth does not know of the aliens; it is in fact not yet quite ready for contact, not having the necessary technology for interstellar travel. But the aliens know Earth and have their agents in place, some of which are trying to nudge selected physicists in appropriate directions. This means that Tom can visit Earth in the second volume of the trilogy, *Being Alien*, to acquire a radical Berkeley wife, Marianne, and learn—and show the reader—something of the way humans can be xenophobic among themselves and that the answer to intergroup conflict may be xenophilia, or an open-minded willingness to embrace the different, the novel, the strange.

The trilogy's third entry, **Human to Human**, takes place just a few years later. Tom's and Marianne's child, Karl, is seven and plays quite naturally with alien kids. The Sharwani, a nonfederation species that has invented gate technology on its own, is refusing membership, busily attacking federation

[2]Yes, other writers have used similar dreamers, but not quite in Chilson's way. And besides, enough writers have used them to make them nearly as much common property as hyperspace and blasters.

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worlds to underline its point. A Sharwani family, male, female, and child, is brought to Tom's and Marianne's apartment for acclimation and education; not surprisingly, Karl helps a good deal. Sharwani infiltrators, surgically disguised as Tom among others, attack Karst, and when they kill a friend, Tom goes just berserk enough to strangle a Sharwani. This tendency to murder is why the federation is leery of humans in general, and of the Sharwani. For punishment, Tom is assigned to the Earth contact team, first to provide more technological hints, then to lie doggo in the Oort Cloud, waiting for the humans to test their new toy.

And then Tom is turned over to the humans for debriefing. This is something of an ordeal, but it does give Ore a chance to tell us which two human groups might be least xenophobic.

Give up? She isn't talking about SF fans. Think for a moment of who must do the debriefing. Intelligence types, spies, those who must be able to see and learn without revealing their emotional reactions. Add to this a Romanian who serves the spymaster as something like a butler, picture in your mind Wodehouse's eternally unflappable Jeeves, and now you have them both. Servants of the state and of the individual. Those who set personal reactions aside in favor of some greater good.

Underline this again when the old bat Black Amber overcomes her antipathy toward birds to bring a long-resistant species into the fold. And again with Tom's comment that all the federation's aliens are each other's keepers.

Human to Human is an excellent ending to the trilogy. Unfortunately, it does demand either that you recall the first two volumes rather better than may be usual or that you reread them just before embarking on this one. Perhaps TOR or the SF Book Club will do us all a favor and publish all three novels in one volume. Then we could read them the way they should be read.

Ore's next novel, she writes to me, will be "a chimera Billy-the-Kid story."

Dave Duncan has been producing some pretty decent stories ever since he discovered he didn't have to crack rocks for a living.[3] The latest is **Strings**, and it's a good read even if, by the end, Duncan has loaded the dice so impossibly against his hero that he must resort to yanking rabbits out of hats.

Duncan exploits the tale of the Asian kingdom whose princes and princesses must, at puberty, each face a pair of opaque jars. One contains a cobra. The other holds a silken rope. The kid must choose one jar and then thrust a hand into it. As any evolutionist who believes in ESP must tell you, this is a situation made to order to select, in the classic Darwinian fashion, for a royal family with the gift of luck, of intuition, of making right decisions on no evidence at all. By the time of Duncan's story, said royal family has an exquisitely reliable gift, and its members are being used to gauge the suitability for colonization of worlds on which brief windows have been opened by 4-I, a UN agency using matter-porting technology based on the dimensionality of the universe (the strings of the title). The head of 4-I is Hubbard Agnes,[4] a quintessential aging bitch-queen, master of blackmail, scheming, plotting, and other items taught in advanced political science courses. She is opposed by Earth-Firsters who are sure that opening win-

[3]He was a petroleum geologist for thirty years.

[4]The name reversal suggests a world in thrall to bureaucrats, but it's the only such suggestion. Perhaps it's a social fossil (like a man walking on the street side of the sidewalk), a remnant of the history between now and then.

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dows will let something awful loose on an Earth already wracked by the Greenhouse Effect, ozone deficiencies, overpopulation (to the point where the scene of the story is "nauc," or the North American urban complex), poverty, plague, political disintegration, and more; by BEST, the technocrat union; by the proponents of the World Chamber, which aspires to replace the UN; and by more.

Enter Cedric, a rawboned youth raised in an organage (*not* an orphanage). He is uneducated but intelligent. He catches on fast. He has immense resilience and tenacity. And when Hubbard Agnes summons him to 4-I and makes him a deputy director of the outfit, when Alya's intuition insists that Cedric is her truest soulmate, when Cedric recognizes aspects of a childhood sweetheart in the person of a media queen, when we learn that 4-I has a secret agenda of sanity and altruism, when . . . Suffice it to say that Duncan limns his background and sets up the essential machinery with considerable deftness, and once everything is ready . . .

The end of the tale might have fallen into place with all the inevitability of a landslide. Unfortunately, Duncan brings a new force on stage at the last moment, compels the landslide to reverse course for a time, and makes essential those lagomorphic hat-tricks. The new force is defeated so promptly that I suspect his editors insisted he cut some large chunk out of his manuscript, and this is all that's left. If my suspicion is right, Duncan should have done a little more rewriting to keep that landslide moving better. But his tale is still worth the reading.

As you might expect from his coeditorship of *Weird Tales* and his past work on H.P. Lovecraft and Lord Dunsany, Darrell Schweitzer has a taste for horror in an antique, Eldritch vein. You will thus not be greatly surprised by the tone and content of **The White Isle**,[5] offered under Owlswick's "Weird Tales Library" imprint. The tale is set in a land of ancient gods, all but one of which have abandoned Earth and their human playthings to roam the broad spaces of the universe. The one still on Earth is Rannon, god of death, who torments all, good and bad, at his whim. Now a prince is born. He grows, all wit, charm, intelligence, and courage. He marries a beautiful princess. Life is idyllic. And then his father-in-law summons him to fight off an enemy. Victory is theirs when the prince receives word that his princess is about to give birth. Off he hies, but when he reaches home, she is dead, the babe unborn.

If your tastes run this way, you may well enjoy the tale. Its dark mood is well evoked and Schweitzer's object lesson in the futility of defying death is as pointed as such things should be. But if you, like me, recognize the author's portrayal of the old White Rock maiden in the underworld, the mood will be shattered and the whole story—with its White Isle, white boat, and white powder to boot—will be reduced to the level of a snickering joke.

Nebula Awards 24 is subtitled "SFWA's Choices for the Best Science Fiction and Fantasy 1988." SFWA, of course, is the Science Fiction Writers of America, Inc., the official "trade group"—not quite a union though it does give its members an almost family-like sense of solidarity and go to bat for members who have grievances—of the

[5]The $18.95 price listed at the beginning of this column is for the 1,200 copies of the trade edition printed. Also available are 50 copies signed and slip-cased for $40.

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SF industry. The 800 or so writers are the group's active members; editors, agents, and other nonwriters involved in the industry are allowed in as "affiliate" members, and they bring the total roster to over a thousand. Only active members vote for the yearly Nebula Awards. Once the winners have been chosen, SFWA selects an editor, in this case Michael Bishop, and assembles a "cream of the crop" anthology containing the winning shorter works, excerpts from longer ones (novel and novella) or essays about them or shorter stories by the same authors, the poetry that won the year's Rhysling Awards (given by the separate Science Fiction Poetry Association), a few other stories thought by the editor to warrant salutes, a summary of the year by Ian Watson, something on and by the latest recipient of the Grand Master award, a couple of "In Memoriam ," and an overview of the Hollywood year by Bill Warren (he says 1988 was "The year of the pratfall").

Lois McMaster Bujold won the novel award for *Falling Free* (it appeared here first as a serial); she is represented by an essay about its origins. Greg Bear talks about Ray Bradbury, the new Grand Master, who then kicks in an essay on censorship and a poem. We then have the short story winner, James Morrow's caustic "Bible Stories for Adults, No. 17: The Deluge"; the poetry, by Bruce Boston, Suzette Haden Elgin, and Lucius Shepard; George Alec Effinger's winning novelette, "Schrödinger's Kitten"; and Connie Willis' winning novella, "The Last of the Winnebagos." Nonwinners include a large chunk of Jane Yolen's novella, "The Devil's Arithmetic"; Jack McDevitt's short, "The Fort Moxie Branch"; Neal Barrett, Jr.'s novelette, "Ginny Sweethips' Flying Circus"; Gene Wolfe's "The Other Dead Man"; Robert Frazier's long poem, "The Daily Chernobyl"; and Paul Di Filippo's "My Alphabet Starts Where Your Alphabet Ends," a paean to Dr. Seuss. Finally, there are Gordon Dickson's memorial to Clifford Simak and Frank Robinson's to Robert A. Heinlein; and the Warren and Watson essays.

You can't lose with this package, can you? Great stories—they tend to show up also in the various "Best of the Year" anthologies—plus summaries of a year's literary and cinematic history, and you can hold it all in one hand.

George Henry Elias's **Breakout into Space: Mission for a Generation** insists that the 76,000,000-strong generation born between 1946 and 1964 holds the reins of the future. This, he says, is a generation gifted by peace, prosperity, liberty, and technology beyond the wildest dreams of past generations, and even beyond the expectations of future generations. This is the generation responsible for the social upheavals of the 60s—civil rights, sexual freedom, drugs, antiwar protests, feminism, and more—yet also the generation of most abject political failure so far. And it is a generation with a mission, a manifest destiny, rooted in the US's identity as "the greatest exploring, settling and developing power the world has ever known." This mission is quite simply reviving the frontier in space, taking humanity into a galaxy empty so far as we can tell of all other sentience, giving humanity a future of wealth and freedom and giving the Earth itself a chance to recover from humanity's environmental depredations.

I had the manuscript to read, so the following quote may not be exactly as it appears in the published book, but here it is: "This generation has a great

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opportunity to live up to its promise by helping humanity evade the multiple dangers threatening it, at the same time that we are strengthening our country and enriching ourselves. The 1990's will renew and upgrade the 1960's. That earlier decade was an immature exercise for our embryonic power and idealism; the 90's will be far different. The revolution is still possible."

We've heard the basic message—we *must* get off this planet—before, many times. We have not, perhaps, heard it linked to a particular generation before, and certainly not to the generation of the 60s. Sadly, Elias's arguments have the harsh sound of jingoistic axe-grinding. We may be pardoned, I think, if we suspect that the author—who "holds degrees in both business and engineering from the University of California at Berkeley" and as "a business broker based in San Francisco . . . sells, starts, markets, and operates small companies"—belongs to his magical generation and remains frustrated over the failure of the revolution in the 60s. He is looking for a destiny, for a hitherto evasive fulfillment. I do not think he will find it this way, for I do not think he will convince anyone who is not already convinced.

ANADEMS

Coming soon: The other day Ian Bacon (P.O. Box 166, Scarborough, Australia 6019) sent me the demonstration version of his "Analog Catalog." When finished and debugged, it will be an IBM-compatible data base or index to everything in *Analog* between 1960 and 1989—by author, title, category, and theme, with the ability to print lists galore on paper—a lovely resource for scholars, libraries, anthologists, and fans. Bacon's letter revealed that he began the project during a Computer Science course and that Davis publications will act as his agent for sales. For further information, contact Charles Ardai or Cynthia Manson at Davis Publications. ■

●Think like a man of action, act like a man of thought.

Henri Bergson

●As I grow older I pay less attention to what men say. I just watch what they do.

Andrew Carnegie

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brass tacks

Dear Mr. Schmidt:

Your Mid-December editorial addressed an issue which I am concerned about, too—excessive fear. It is a current obsession with us, and it encompasses every area of our life. Pollution, land, sea, and air, threatens our very existence: Will we be able to get it under control? The world's population reached five billion in November 1987, and may double again in less than 50 years. Do we face mass starvation and other human suffering because of this problem? There are enough missiles to destroy our entire population many times over. Is there going to be a nuclear war which could, at best, only end in a pyrrhic victory for any nation? American prisons are crowded, and crime is, overall, increasing. Are we becoming a lawless society?

The list goes on, and it is intensified by the myriad information which we are bombarded with. Human beings, past and present, have always had much to fear, but never so much data (pro and con) to work with.

But there is also much to be optimistic about, and, in spite of the many things to fear, we must live our everyday lives. Even if the world is coming to an end tomorrow, we have to live today and find the good that is in it. And we have to develop the common sense to sift through our mountain of daily information carefully, discarding much of it as useless and putting the rest in its proper perspective.

JAMES T. SIZEMORE

Romeoville, IL

Dear Dr. Schmidt,

I always find your editorials interesting and thought provoking, and I usually agree with your point of view. I must, however, take issue with some state-

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ments you made in "Fear Pollution" (Mid-December 1989).

Regarding cancer and heart disease, you state that "most people used to die quite early of other causes, so few had time to develop these." In a study of family genealogical records, I made a histogram of those who died before 1900; prompted by statements by the medical community such as "most people died before the age of 45" and "medical science has increased longevity enormously."

My study showed that, as usual, statistical data can be interpreted in ways that are very misleading. I found that the average age at death was 45 years. The plot was a curve very similar to a normal distribution (the bell-shaped curve) except for two anomalies: a very large spike between the ages of zero and five years (stillbirths were not counted) and another, smaller but very prominent spike between 20 and 25 years.

If the first spike was disregarded, the average age at death became about 60 or 65; if both spikes were removed, the result became almost 75 years!

The data included about 350 people and spanned the years from about 1600 to 1900. It is certainly not a carefully controlled scientific study, and it probably provides more questions than information. My speculation is, however, that the great increase in longevity that the medical community is so proud to cite results primarily from removing these two spikes from the curve.

The spike near zero is easy to understand; prenatal and early postnatal care was almost nonexistent, and infants are very vulnerable to all kinds of diseases and mishaps. But I am at a loss to explain the spike at about 20 years. Although my records seldom give the cause of death, I can be sure that they were not caused by the first thoughts I had, namely childbed fever and war. The deaths were about equally divided between males and females; none of the females died during or just after childbirth, and few, if any, of the males died in war (possibly one or two). One died in a fall from a horse; one died at a barn raising (presumably part of the barn fell on him); one or two were lost at sea; but for most of the deaths I have no cause. I have tried to guess the reason for this spike from physician acquaintances, but so far there have been no guesses. Maybe you or some reader can provide some plausible explanation.

Also, if anyone knows of a similar study made on a much larger scale, I would be interested in learning about it.

ARTHUR E. SHERBURNE

Hollis, NH

Dear Stan,

With regard to your recent editorial, "Fear Pollution," and many of the letters regarding the so-called environmentalist positions, you are entirely correct. The fear mongers are hard at work again. It is not new. I have seen copies of 19th century newspapers stating that the railroad marked the end of civilization. Such fear mongering is probably older than civilization itself.

Today the doomsayers have picked the "Greenhouse Effect" to mark the end of civilization if we don't *do something quick!* It has been brought to my attention that the ozone hole was discovered the very first time somebody looked up with the right equipment. I'm told it was circa 1954. There has been no statistically alarming change since that date. *Scientific American* recently printed in "Science & the Citizen" that the most recent climate models indicate that at worst the greenhouse effect will cause a 1° C increase in temperature, not 4 or 5 as previous models indicated.

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Possibly not that much. Not enough to cause the doomsday conditions that are currently being bandied about by the media and people with axes to grind.

Here is the problem: probably 99.9% of fear mongering is based on incorrect data or conclusions. The media's gleeful presentation of doomsday predictions will put such on the credibility scale right next to Chicken Little's—right where most belong. We'll miss the .1% correct prediction that we could have handled if given timely warning. Worse, in real disaster, the geologists missed the San Francisco earthquake clean. Their predictions are no better than the ones you or I could give. Doomsday people with credentials are curretly given lots of respect. I worry that as these folks continue to seek the media spotlight that all will begin to be seen as Dr. Bozo. What's the solution? Maturity? Self-restraint? Peer pressure? Possibly a "Crackpot News" or "Crackpot Science" publication in which the latest scientific wild ass guess can be published free of unwarranted credibility or overreaction? Hopefully leaving us free to separate the wheat from the chaff?

For example, do you know which issue of *Analog* contained the article on North and Eastern Africa accurately predicting the current drought and famine? I seem to recall it was after '68 and before '75, but cannot locate in the old issues. Demonstrates the problem clearly.

PETER C. OSBORNE
P.O. Drawer 1
East Hampton, NY 11937

Dear Sir:

I am not an editor. I do not have the background or the qualifications for that high office. But I do claim the right to question the editor's judgment.

I am referring to Maya Kaathryn Bohnhoff's novelette "Hand-Me-Down Town," that takes up so much space in your Mid-December issue. It's a cute enough little story, not really too inexpertly done, clearly designed to bolster this year's preoccupation with The Homeless. It is complete with the archetypal wicked conservative politician, the archetypal noble civil rights lawyer, all sorts of other characters doted upon by our bleeding-heart left-leaning journalists and statesmen, and even a few fleeting references to the "alternative energy sources" equally beloved by those worthies.

Don't misunderstand me; I am a liberal of many decades' standing. I know that there are many unfortunate homeless people. I am on the advisory board of a well-known agency that ministers to them. Homelessness did not, as many of our liberals would have us believe, originate during the Reagan administration—I saw many such people in New York, Washington, San Francisco and elsewhere during the Truman years.

Now, I have nothing against the Bohnhoff novelette *per se*. But apart from its implied setting in some near future, and some fleeting mention of such advanced devices as flat-screen televisions, pocket "compads," and so on—all contrived and utterly incidental to the plot (such as it is)—what on earth does this story have to do with science fiction—much less science fact? Oh, I suppose you could argue that it is fantasy—but it still has absolutely no place in *Analog*. If you find it impossible to come up with enough good material relating to science or to science fiction to fill thirteen issues a year, then cut back to twelve. No one will notice.

M. S. LICHTENSTEIN

The subjects of science fiction are not limited to "hardware" science. "Hand-Me-Down Town" was seen by many

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readers as an outstanding piece of sociological science fiction. Some may object that sociology is not a science in the same sense as chemistry or physics, but there was a time they weren't either. All three are suitable, and important, subjects for speculation.

Dear Dr. Schmidt,

"Hand-Me-Down Town" is the most heartwarming story I have read in many a year. It made me want to pack up my toolbox and head for Serendipity Springs.

Could such a story happen in reality? I don't know, but I would sure like to participate in an attempt at it (and I assure you my carpentry is better than my typing; correcting typewriters are a blessing).

My appreciation to Maya Bohnhoff for writing it, and to you for publishing it.

CLYDE A. WILKES
(Analog/Astounding reader since 1946.)
2465 Cecelia Ave.
Brentwood, MO 63144

Dear Mr. Joel Davis,

Allow me to compliment you and your staff for publishing the story by Maya Kaathryn Bohnhoff in your Mid-December issue. I gave my copy to the men of S.H.A.G. They were the eleven older gentlemen from Seattle who attended the recent homeless events in Washington, D.C. They reside in the two places where I work as a drug and alcohol counselor in Seattle.

This story ranks, in my humble opinion, along with the classics *Gulliver's Travels*, *Swiss Family Robinson*, and other similar fiction depicting social problems of their day.

It doesn't leave out anything we in the field of chemical dependency have been saying for a long time. And you have national circulation among readers who think.

I've listened to two of the first sixty American alcoholics who went to Russia as guests of the government, who started both A.A. and N.A. there (yes, there are heroin addicts in Russia and God is not dead in the Soviet Union!) They were, incidentally, housed in the Kremlin when we bombed Kadafi.

If reprints are available, please let me know. If permission is necessary to copy and distribute that story where it may do some good please send it to me.

The Good Will games are coming to Washington. Situations similar to those in the story will occur unless we have some sort of a plan to head them off.

JANE M. KELLEY, R.N., CDS II
Puyallup, WA

Dear Dr. Schmidt,

I don't know what a story like "Hand-Me-Down Town" was doing in *Analog*, but I certainly do thank you for including it.

I just happened to read "Hand-Me-Down Town" Thanksgiving morning. That afternoon, I was taken to Thanksgiving dinner at a local favorite camping spot with the rural equivalent of the story's characters.

Dinner was chaotic (though abundant). Poor judgment was rampant. Several people were actively psychotic. Yet the kind of potential depicted in the story was present.

"Hand-Me-Down Town" is a wishful fantasy. Nonetheless, it is so well rendered it is a believable fantasy. It is also a very constructive one. Sometimes a little creative optimism is just what the doctor ordered to nudge people's consciousness in a positive direction.

Once again, thank you.

UNCLE RIVER
(STEPHEN KAUFMAN, PH.D.) ■

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a calendar of analog upcoming events

28-30 September
CONTACT 8 (Indiana SF conference) at Ramada Inn, Evansville, Ind. Fan Guest of Honor—Gary Robe, Special Science Guest —Dr. Bill Breuer. Registration—$15 until 1 September, $20 thereafter. Info: SF Convention, Box 3894, Evansville IN 47737. (812) 428-0549 before 10 p.m. CDT.

5-7 October
CONTRADICTION TEN (Niagara Frontier SF conference) at Days Inn Fallsview, Niagara Falls, N.Y. Guest of Honor —Christopher Hinz; Special Guests —George Zebrowski, Joan D. Vinge, Nancy Kress. Registration—$17 until 11 September, $20 thereafter. Info: Contradiction, Box 2043, Newmarket Station, Niagara Falls NY 14301.

19-21 October
INVENTION (Wisconsin SF conference) at Sheraton Racine, Racine, Wisc. Guest of Honor—Esther M. Friesner. Info: Invention, % Jim Rittenhouse, Box 37317, Milwaukee WI 53233.

19-21 October
NotJustAnotherCon 6 (Western Massachusetts SF conference) at UMass Campus Center Hotel, Amherst, Mass. Guest of Honor —David Drake, Art Guest of Honor —Hannah Shapero, Special Guests —Chris & Janet Morris. Registration—$15 until 22 September, $17 to 18 October, $19 at the door. (Payments to S.C.U.M.). Info: SF Conventioneers of UMass, RSO Box 16, S.A.O., UMass., Amherst MA 01003. (413) 545-1924.

19-21 October
Con'Stellation IX: Sagittarius (Northern Alabama SF conference) at Sheraton Inn, Huntsville, Ala. Guest of Honor—Lois McMaster Bujold, MC—C. J. Cherryh, Artist Guest of Honor—Tom Kidd, Fan Guest of Honor—Susan Honeck. Registration—$18 until 30 September, $22 thereafter. Info: Con'Stellation IX: Sagittarius, Box 4857, Huntsville AL 35815-4857. Include SASE.

19-21 October
6th Annual Midwest Space Development Conference at Holiday Inn, Westlake, Ohio. Tracks on space, education, astronomy. Registration—$40 until 1 September. Info: MSDC, 90 at 524 West 6th Street, Lakeside OH 43440.

26-28 October
NECRONOMICON '90 (Tampa area SF conference) at Holiday Inn—Ashley Plaza, Tampa, Fla. Guests of Honor—Jack C. Haldeman II, Lawrence Watt-Evans. Registration—$15 until 15 September, $20 thereafter. One day memberships $8. Info: Necronomicon '90, Box 2076, Riverview FL 33569. (813) 677-6347.

29 August-2 September 1991
CHICON V (49th World Science Fiction Convention) at Hyatt Regency, Chicago, Ill. Guest of Honor—Hal Clement; Artist Guest of Honor—Richard Powers; Editor Guest of Honor—Martin H. Greenberg; Fan Guests of Honor—Jon & Joni Stopa. Registration —$95 until 31 December 1990. Supporting —$20 at all times. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: Chicon V, Box 8121, Columbus OH 43221-8121.

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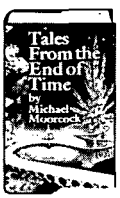

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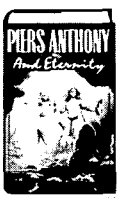

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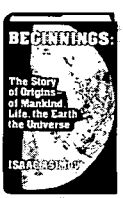

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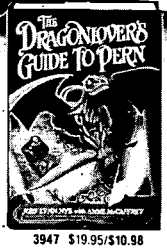

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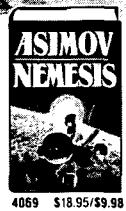

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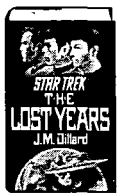

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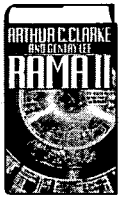

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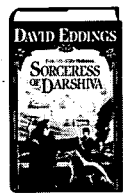

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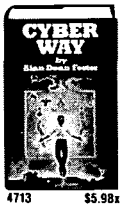

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